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ABSTRACT

The final report of the University of Connecticut Health Center curriculum project entitled "A Data-Based Approval to Developing a Curriculum" is presented. The aims of the project were these: (1) to develop procedures for judging and cross-judging the goals and objectives of undergraduate medical education; (2) to implement these procedures by collecting expert and non-expert judgments from faculty within and outside the University of Connecticut; and (3) to present this data as the basis for shaping the curriculum. Based on the judgments of 135 committee participants, goals and objectives are outlined in section one for such courses as those in ambulatory care, cardiovascular, central nervous system, biostatistics, clinical medicine, obstetrics and gynecology, pathobiology, pediatrics, and surgery. Section two describes the methodology developed and utilized in carrying out the work of explicating these performance standards during the two-year duration of the project. Appendices include: curriculum objectives; suggested behavioral verbs provided to faculty; scales of clarity and centrality on which objectives were rated; changes in the Hematology objectives during their development; and an example of revisions in objectives of the Growth and Development subject committee. (LC)

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CORE GOALS AND OBJECTIVES OF THE UNIVERSITY OF CONNECTICUT SCHOOL OF MEDICINE: THE PRODUCT AND THE PROCESS

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Project sponsored by The National Fund for Medical Education

Craig L. Gjerde, Ph.D. and T. Joseph Sheehan, Ph.D.
Department of Research in Health Education
University of Connecticut Health Center
Farmington, Connecticut 06032

August, 1975

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PREFACE

This is the final report of the University of Connecticut Health Center curriculum project entitled "A Data-Based Approach to Developing a Curriculum." According to the grant which was funded by the National Fund for Medical Education, the aims of the project were:

1. To develop procedures for judging and cross-judging the goals and objectives of undergraduate medical education.
2. To implement these procedures by collecting expert and non-expert judgments from faculty within and outside the University of Connecticut.
3. To present these data as the basis for shaping the curriculum.

Section I of this document contains the goals and objectives of the 24 teaching committees which form the core of our medical school experience. An index to these committees will be found at the beginning of Section I. The objectives of a few committees are incomplete; this is due to philosphical and time conflicts. The objectives that are here represent the efforts of about 70 persons in the writing phase and the judgments of about 135 other persons who taught on those committees.

These objectives represent an attempt to specify the knowledge, attitudes, and skills which our faculty expect each student to have at the time he or she completes that particular course—in a sense they are the performance standards against which students can be evaluated.

Section II describes the metholology which was developed and utilized in carrying out the work of explicating these performance standards during the two year duration of the project.

Special thanks are due to Dr. T. Joseph Sheehan and to Dean C. F. Hinz for their guidance on the project and to the teaching committee chairmen and faculty members who contributed their time and thought to the detail work. Thanks are also due to Christine Moulis, S. Douglas Arnold, and Sally Emmanuel for their typing, and to Mark Bargen for the data analysis.

Craig L. Gjerde, Ph.D.

Section I

These pages contain the goals and objectives of the following teaching committees, arranged in alphabetical order:

FIRST YEAR COMMITTEES

Cellular and Molecular Biology
Social and Behavioral Sciences
Tissue Biology
Pathobiology
Musculoskeletal System
Central Nervous System
Introduction to Clinical Medicine I

SECOND YEAR COMMITTEES

Renal-Urinary System
Introduction to Biostatistics
Cardiovascular System
Respiratory System
Gastrointestinal System
Hematology
Endocrine-Reproduction
Growth and Development
Pharmacology
Introduction to Clinical Medicine II

CLINICAL CORE COMMITTEES

Introductory Clerkship
Ambulatory Clerkship (proposed)
Obstetrics/Gynecology Clerkship
Medicine Clerkship
Pediatrics Clerkship
Surgery Clerkship
Psychiatry Clerkship

For every committee, the objectives specify the level of performance which is expected of each student at the completion of that particular teaching committee. The citation of Subject Committee Chairman refers to the faculty member who was in charge of the teaching committee at the time the objectives were written; the date of the last revision is indicated at the bottom of each title page.

University of Connecticut Health Center
Committee on the Curriculum

Subject Committee Chairman: G. Lewis
Curriculum Committee Chairman: C. Gjerde

AMBULATORY CARE CLERKSHIP (Proposed)

EDUCATIONAL GOALS AND OBJECTIVES

GOALS

1. Describe and critique various systems of delivery of ambulatory medical care, including: solo private practice, group practice, prepaid group practice (HMO), hospital clinics, and hospital emergency rooms.

2. Have experience and skill in the management of problems of both an episodic and continuing nature in an ambulatory setting.

3. Have knowledge of the changing role of health professionals (including physicians) in the delivery of ambulatory medical care.

4. Appreciate the strengths and limitations of various allied health personnel through participation in a setting in which he can learn to share responsibility for decision making with and function as consultant to other health professionals.

5. Demonstrate an acceptable level of skill in the manipulation of the Problem Oriented Record system in the delivery of ambulatory medical care.

6. Understand current efforts to evaluate the quality of medical care being delivered through mechanisms such as peer review, medical audit, and outcome measurements, and should have experience in at least one of these mechanisms (both as an auditor and an auditee).

7. Have knowledge of the principles, techniques, and cost effectiveness of the early detection of illness.

8. Understand the principles, techniques, problems, and limitations of programs for the prevention of illness.

9. Understand the problems encountered in restoring patients to or maintaining their maximal level of function, and the ways in which many agencies and services can help to overcome these problems.

10. Understand the costs involved in the delivery of ambulatory medical care and the means available for defraying these costs.

11. Understand the role of psychological and environmental factors in the etiology of illness and the impact of illness on the psyche of persons who are sick.

January 14, 1975

ACC

12. Be able to assess the mental status of patients and to recognize those in whom serious psychological problems exist.

13. Understand the pathophysiology, diagnostic features, and principles of management of certain problems which are commonly encountered in the delivery of ambulatory health care.

* Note: This clerkship is still in development.

University of Connecticut Health Center
Committee on the Curriculum

Subject Committee Chairman: A. Pappano
Curriculum Committee Chairman: C. Gjerde

CARDIOVASCULAR

EDUCATIONAL GOALS AND OBJECTIVES

OBJECTIVES

1. Describe the heart and name the important structures including the conduction system and vascular supply.

2. Name the basic physiologic principles which relate the shape to the function of the heart (e.g., hypertrophy, cardiomyopathy, muscle metabolism).

3. Describe the formation of the heart with emphasis on septation and great vessel orientation.

4. Describe the sequence of mechanical events in the heart during a cardiac cycle and describe the pressure development in various areas of the body as a result of that cycle.

5. Discuss the basic electrical properties of cardiac muscle and specialized conduction fibers, and relate these to the mechanical events of cardiac contraction.

6. Discuss the ultrastructure and cellular physiology of the myocardial cell.

7. Describe the fetal circulation, its anatomic components, its functional capabilities, and describe the changes which normally occur at birth.

8. Describe the functional anatomy of the pulmonary circulation and its relationship to the fetal circulation and to the changes which occur at and after birth.

9. Describe errors in cardiac septation (VSD and ASD); relate these to normal cardiac embryology; describe the physiologic consequences of these defects and their clinical sequelae.

10. Discuss the maldevelopment of the conotruncus (e.g., the tetralogy of Fallot); relate these to normal cardiac embryology; describe the physiologic consequences of these defects and their clinical sequelae.

11. Discuss the embryologic development of transposition of the great arteries; relate these to normal cardiac embryology; describe the physiologic consequences of these defects and their clinical sequelae.

12. Define cardiac failure as a myocardial event and discuss its clinical sequelae as related to its site and cause of failure.

January 6, 1975

CV

13. Graphically time and relate the intracardiac events with their consequences in the peripheral arteries and veins.

14. Assess methods of measuring intracardiac pressures and oxygen saturation; given appropriate information, calculate cardiac output, pressure gradiants, and intracardiac shunts.

15. Diagram the physiology of a cardiopulmonary bypass and its application in the repair of cardiac defects.

16. Evaluate the consequences in the disturbance in the nutrition of a cardiac muscle.

17. Describe the response of the heart to different disease states: (e.g., localized injury, fibrotic replacement or infiltration of the myocardium, ischemia, dilitation and hypertrophy).

18. Describe abnormalities of the conduction system (arrhythmia) and the mechanisms of action of cardiac drugs.

19. Describe the pathophysiology of hypertension and the adaptation of the heart.

20. Describe the mechanisms of action of any hypertension drugs on heart and circulation.

21. Discuss the consequences of peripheral vascular disease, including arterial, venous, and lymphatic.

22. Discuss the pathophysiology of disturbances in the rheology of flow, small vessels, formed elements, and special circulation (skin, cerebral, and renal).

GOALS

STREPTOCOCCUS

* Understand the aspects of the biology of the stretpococcus which relate to clinical problems.

OBJECTIVES

STREPTOCOCCUS

23. Discuss the antigenic components of the streptococcus as they relate to streptococcal immunity.

24. Describe the use of antibody tests in clinical problems, (e.g., subitre).

25. Describe the cultural characteristics of beta-hemolytic streptococci and distinguish them from other pharyngean flora.

26. Discuss the relationship between streptococcus and disease according to their groups and their hemolytic characteristics.

RHEUMATIC FEVER

27. Discuss the epidemiologic, immunologic, and clinical evidence of the streptococcal etiology of acute rheumatic fever.

28. Describe the pathology and sequelae of the various systems involved in acute rheumatic fever.

29. Discuss the preventability of initial occurence and recurrent attacks of acute rheumatic fever.

30. Explain why rheumatic fever is more likely to occur in school age children, lower socio-economic status groups, and at certain times of the year.

PHYSIOLOGY

31. Explain the relationship between pressure, flow, and velocity (Poiseuille's Law) as it applies to blood flow in the arterial system.

32. Explain the relationship between resistance and tube diameter.

33. Describe the relation between pressure, wall tension, and caliber of vessels as expressed in the Law of Laplace.

34. Discuss the significance of the behavior of the systemic arteries as capacitance.

35. Explain the changes on pressure in the atria, ventricles, and aorta during the various phases of the cardiac cycle.

36. Correlate these pressure changes with: (1) the ventricular volume curve, (2) the heart sounds, and (3) the electocardiogram.

37. Discuss the determinants of mean arterial pressure and of systolic and diastolic pressure.

38. Explain the overall feedback control of arterial pressure.

39. Describe the role of baroreceptors, chemoreceptors, and reflexes in the regulation of the mean arterial pressure.

40. Discuss the role of capillary fluid shift and stress relaxation in regulation of arterial pressure.

41. Explain the role of the kidney in the regulation of arterial pressure (renal fluid, volume mechanism, aldosterone, renin, and angiotensin).

42. Explain the Fick and indicator-dilution methods for measuring cardiac output.

43. In the heart-lung preparation, describe in detail (1) the length-tension relationship, (2) the pressure-volume relationship, (3) the effects of a change in venous return, (4) the effects of a change in peripheral resistance, and (5) the effects of a change in heart rate.

44. Define homeometric autoregulation.

45. Describe the frequency-force relationship.

46. Describe the innervation of the heart.

47. Describe the following reflexes affecting heart rate: (1) Bainbridge reflex, (2) Baroreceptor reflex, (3) Chemoreceptor reflex, and (4) Respiratory arrhythmia.

48. Describe the effects of sympathetic and parasympathetic neural activity on myocardial contractility.

49. Describe the reflex and hormonal regulation of myocardial contractility.

50. Describe the influences of changes in pO_2, pCO_2, and pH on myocardial contractility.

51. Describe the inherent regulation of cardiac output (Frank-Starling Law of the heart).

52. Discuss the use of cardiac and systemic function curves in the analysis of cardiac output regulation.

53. Discuss the progressive changes in cardiac output and right atrial pressure during different stages of cardiac failure.

54. Compare the effect of acute and chronic left-sided and right-sided heart failure on the following: (1) arterial pressure, (2) cardiac output, and (3) glomerular pressure.

55. Discuss the changes that occur in the relation between right artial pressure and cardiac output and venous return as a result of the following: (1) Acute ventricular failure, (2) High cardiac output failure-overloading of the heart.

56. Discuss the role of the following compensatory mechanisms in the adaptation to blood loss: (1) Baroreceptor reflexes, (2) Chemoreceptor reflexes, (3) Cerebral ischemia, (4) Reabsorption of tissue fluids, (5) Endogenous vasoconstrictors, and (6) Renal conservation of water.

57. Discuss the role of the following decompensatory mechanisms in response to blood loss: (1) Cardiac failure, (2) Acidosis, (3) Cerbral ischemia, (4) Blood clotting aberrations, and (5) Reticuloendothelial depression.

EDUCATIONAL GOALS AND OBJECTIVES

OBJECTIVES

CELLULAR LEVEL

1. Define the following properties of living cells and describe their function in other cellular processes: irritability, conductivity, movement, exertion and secretion, absorption, assimilation, and metabolism.

2. Explain the metric system down to the A scale of measurement and state the size of red blood cells and approximate range of sizes of other cells.

PRINCIPLES OF MICROSCOPY

3. Explain the difference between resolution and magnification; state the limit of resolution of the naked eye and calculate the resolution of a light microscope.

4. Recall that visualization through a microscope involves modification of the light rays and recall the ways in which light can be modified so that we can see contrast.

5. Recognize the limitations of seeing something through the microscope and indicate the ways in which these can be overcome; e.g., staining or the phase microscope overcome the problem of contrast; the electron microscope extends the range of sizes.

6. State the general principles of the electron microscope and explain why its limit of resolution is so low and what properties of the specimen enable us to visualize it.

7. List the names and uses of the other special microscopes.

8. Use a light microscope properly.

CELL ORGANELLE

9. For each cell part mentioned in the syllabus, sketch a visual image of its appearance with both light and electron microscope.

10. For each of these cell parts: (a) state whether it is easily seen in the light microscope, seen with difficulty, or seen only with the electron microscope; (b) state whether it can be seen in a routine slide or if special

techniques are needed; (c) describe how each part participates in the properties of living cells reviewed in Objective 1 and, insofar as is evident, how the morphology is related to the function.

NUCLEUS

11. Recognize when two nuclei look alike or are sufficiently different to represent two cell types.

12. Explain what chromatin granules actually represent.

13. Describe how the structure of the nuclear membrane regulates information transfer from nucleus to cytoplasm.

MITOCHONDRIA

14. Recall that enzymes are fixed on inner and outer membranes and cristae, and state the importance of this arrangement.

15. Recall that mitochondria contain the requirements for a self-replicating system, including DNA, and describe the significance of this in terms of possible heterogeneity and cytoplasmic mutation.

RIBOSOMES, ENDOPLASMIC RETICULUM, GOLGI APPARATUS AND SECRETION GRANULES

16. Identify what the chromophil substance seen in these organelles actually represents.

17. Describe the current idea concerning the role and interrelation of each of these in the formation of a protein secretion.

LYSOSOMES

18. Describe the process of intracellular digestion in terms of the role of the different types of lysosomes and related vacuoles.

19. Predict the pathological consequences of possible defects in the lysosomal system.

CELL MEMBRANE

20. Explain the concept of the "unit membrane" in terms of appearance, and the assumed structural interpretation of it.

21. Recognize the limitations of the unit membrane concept in explaining physiology of the membrane.

22. State current alternative ideas of mobile proteins in lipid matrix.

CMB

BACTERIAL ANATOMY

23. Describe the differences between bacterial and eucaryotic nuclei.

24. Describe the structures present in eucaryotes but absent in bacteria.

25. Explain structures in bacteria which carry out functions which in eucaryotes are carried out by structures not present in bacteria.

26. Explain the importance of a complex cell envelope.

HISTOLOGICAL METHODS

27. Describe how slides are made and identify the ways in which a tissue has been altered in preparing it for examination and the artifacts which can be created.

28. Illustrate the mechanism of acid-base staining so that by knowing the pH during preparation of an ordinary hematoxyline-eosin slide they can predict which tissue components will be stained, and predict how the staining will change as the pH is changed.

29. Recognize the limitations to the above interpretation of staining.

30. Describe the major types of special stains, (e.g., histochemical stains for specific chemical components and enzymes) and state which chemical components stain with the PAS technique and explain its mechanism in chemical terms.

31. Describe the use of the gram stain in dividing bacteria into two groups and recognize that the stain is likely a function of the cell envelope.

MOLECULAR LEVEL
PROTEIN STRUCTURE AND FUNCTION - AMINO ACID CHEMISTRY

32. Define pH, pK, pI, and buffer capacity.

33. Estimate approximate pH values from a knowledge of the pK and calculate exact pH values by use of the Henderson-Hasselbach equation.

34. Recognize the structure of an α-amino acid and categorize the side chains as non-polar (hydrophobic), polar uncharged, polar positively or polar negatively charged.

35. State the structural basis for stererisomerism.

PROTEIN STRUCTURE

36. Define and recognize: peptide bond, disulfide bond, hydrogen bond, ionic bond, hydrophobic bond.

37. Identify the 1^{o}, 2^{o}, 3^{o}, and 4^{o} structures in a given protein conformation and the major types of bonds (interactions) involved in each.

38. Describe the major physical and chemical techniques employed for study of conformation and the types of information obtained from these.

39. Write the primary structure of a polypeptide based on the results obtained from the following techniques: 1) amino acid analyses 2) determination of the number of polypeptide chains (N and C terminal analysis, separation of chains after denaturation, cleavage of -S-S-bonds; 3) partial hydrolysis of polypeptide chains by specific proteolysis of chemical means; 4) isolation of peptides (electrophoresis, ion exchange); 5) sequencing of peptides.

ENZYME STRUCTURE AND FUNCTION

40. Explain the concept of chemical equilibrium and calculate the free energy change in a chemical reaction.

41. Define a catalyst and describe the effect a catalyst has on the rate and equilibrium of a reaction.

42. Explain the principles of simple enzyme kinetics (substrate specificity, substrate saturation (V_{max}, K_m) and competitive and non-competitive inhibition) in terms of molecular interactions and recognize and interpret Lineweaver-Burk plots.

43. Describe the general mechanisms of enzyme catalysis including the participation of amino acid residues.

44. Describe the major experimental approaches to enzyme mechanisms.

NUCLEIC ACID STRUCTURE AND FUNCTION

45. Identify the distinguishing structural features of purines and pyrimidines.

46. Recognize the chemical differences between bases, nucleosides and nucleotides and between DNA and RNA.

47. List the major bases found in DNA and RNA.

48. Recall the occurrence of minor bases in DNA and RNA.

49. Use standard nomenclature and abbreviations (e.g., CPT, dUMP, 5'pApC... pU3', etc.).

50. Describe a model of the double helix which illustrates: 1) the concept of strand polarity; 2) the physical properties of a long fibrous molecule; 3) the requirements for bases pairing and forces which stabilize this structure; 4) strand separation and reforming, in terms of: a. changes in physical and biological properties, and b. requirements for separation and reunion.

51. State the cellular location of the several classes of nucleic acids.

52. Describe the function of DNA, r-RNA, tRNA and hnRNA.

53. Describe how the structure of tRNA and DNA contribute to their function.

CARBOHYDRATE STRUCTURE

54. Compare and contrast the structural features of monosaccharides and transform one structural representation (e.g., Haworth) into another (e.g., Rischer).

55. Identify the anomeric carbon and discuss its chemical reactivity.

56. Recognize the principal carbohydrate derivatives.

MEMBRANE STRUCTURE AND FUNCTION

57. Identify the locations of cellular membranes, including plasma, mitochondrial, nuclear, endoplasmic reticulum, golgi, lysosomal.

58. Describe the general properties of membranes, including barrier and selective transport functions.

59. Identify the chemical compounds found in membranes and their approximate proportions.

60. Explain how the amphipathic property of certain molecules (including phospholipids, glycolipids, sterols, and proteins) contribute to membrane structure and function.

61. Describe the organization of lipid and protein molecules and the location of the carbohydrate chains in membranes, according to the fluid mosaic model.

62. Describe the concepts of fluidity and lateral diffusion.

63. Define pinocytosis, free diffusion, aqueous pores, carrier-mediated transport, active transport.

64. Describe the general mechanisms whereby metabolic energy can be coupled to membrane transport.

65. Explain the role of Na+ -K+ ATPase in Na+ and K+ transport.

MACROMOLECULAR SYNTHESIS - GENERAL PRINCIPLES

66. Recall that most macromolecules are linear sequences of small metabolites.

67. Recall that the general flow to information is from DNA to RNA to protein.

CME

68. Recognize that macromolecular synthesis is thermodynamically disfavored and this thermodynamic problem is overcome by coupling exergonic reactions to biosynthetic reactions.

69. Recall that macromolecular function is often controlled by post-transcriptional and post-translational modifications of nucleic acids and proteins.

PROTEIN SYNTHESIS

70. Define condon, anticondon, triplet code, transcription and translation.

71. Explain the coding relationships of DNA, mRNA and tRNA.

72. Describe the sequence of events which lead to polypeptide synthesis including: (a) the role of DNA, mRNA, tRNA, ribosomes, polysomes, activating enzymes, initiation factors and elongation factors; and (b) sequence of events, including: amino acid activation, initiation, elongation, termination.

NUCLEIC ACID SYNTHESIS

73. For the following four reactions: DNA replication, RNA dependent DNA synthesis, DNA repair, and DNA dependent RNA synthesis: (a) recall the enzymes involved (including the direction of synthesis and the biological significance; (b) describe the role of base pairing in the four reactions in #73 above; and (c) distinguish conservative from semi-conservative from dispersive replication of DNA; and (d) recognize the topological problems involved in DNA replications.

INTERMEDIARY METABOLISM - GENERAL PRINCIPLES

74. Explain the role of biological oxidations as source of energy for useful work (chemical, mechanical, etc.).

75. Describe the concepts of: the high energy bond (~), the coupling of oxidation to formation of ~ and the role of ATP in metabolism.

76. Explain the general function of co-enzymes in substrate activation and group transfer reactions.

77. Discuss the principles of metabolic control including the use of separate pathways for biosynthesis and degradation, and the role of control points in metabolic pathways (e.g., first committed reaction) and their regulation by mechanisms described in Post Translational Control #173.

CARBOHYDRATE METABOLISM - GLYCOLYSIS

78. Write the chemical reactions catalyzed by the following key enzymes and locate these reactions in the overall metabolic scheme: hexokinase, phosphofructokinase, aldolase, Ga-3-P dehydrogenase, 6-PGA dehydrogenase (oxidative reactions), glycogen systhetase and phosophorylase.

17

79. Discuss the necessity of maintaining redox balance and recall the major mechanisms for regenerating NAD anaerobically.

80. Trace carbon from glucose to lactate.

81. Identify which glycolyte intermediates are biosynthetic precursors.

HEXOSE MONOPHOSPHATE SHUNT

82. Describe the major functions of the shunt.

83. Explain the general type of reaction catalyzed by transketolase and transaldolase.

84. Recall that pertose-P and fructose-P are reversibly interconverted by transketolase and transaldolase pathway.

GLYCOGEN METABOLISM

85. Illustrate the function of glycogen as the storage form of glucose.

86. Write the steps in the conversion of C-6-P to UDPG, and describe the general function of nucleotide sugars.

87. Recall the auxiliary enzymes of branching and debranching.

88. Describe the mechanism of reciprocal control of synthetase and phosphorylase by cycAMP.

89. Recall control by metabolities and its function in modulation of activity.

OXIDATIVE METABOLISM - PYRUVATE DEHYDORGENASE COMPLEX

90. Write the overall chemical reaction including the function of the coenzymes.

91. Recall the multienzyme nature of the complex, and its mitochondrial localization.

CITRIC ACID CYCLE

92. Write the chemistry of the condensation reaction.

93. Indicate the number and location of the oxidative steps.

94. Discuss the cyclic nature of the pathway.

95. Explain the function of the pathway in oxidative metabolism.

CME

96. Recall the mitochrondrial localization and apply the principal of compartmentalization to the mitochondrial-cytoplasmic interrelations.

TERMINAL ELECTRON TRANSFER AND OXIDATIVE PHOSPHORYLATION

97. Identify the subcellular location of the oxidative phosphorylation couples.

98. Outline the general path of electrons to O2 including the nature and function of cytochromes.

99. Recall the redox potential and its relation to ΔG and the path of spontaneous electron flow.

100. Recall that ATP synthesis is coupled to respiration and write the spontaneous electron flow.

101. Compare and contrast chemical coupling, chemiosmotic theories of oxidative phosphorylation.

102. Recall the alternative uses of $\sim$, e.g., ion transport.

FATTY ACID METABOLISM - FATTY ACID OXIDATION

103. Outline fatty acid oxidation describing the production of acetyl CoA and explain its relation to citric acid cycle.

104. Define the function of triglyceride stores, and recall the mechanism of release of free fatty acids.

105. Recognize the localization of the oxidative enzymes and recall the carnitine shuttle.

FATTY ACID BIOSYNTHESIS

106. Outline the Overall pathway: glucose → fatty acids.

107. Describe the participation of acetyl CoA, malonyl CoA, acyl carrier protein and acetyl CoA carboxylase (including the function of biotin).

108. Identify the cellular localization of the synthetase and describe in principle the mitochondrial-cytoplasmic shuttles required (citrate shuttle).

AMINO ACID METABOLISM - INTERRELATION WITH GLYCOLYSIS AND CITRIC ACID CYCLE

109. Recall that most amino acids are derived from and degraded to intermediates of glycolysis and the TCA cycle.

110. Describe the chemistry (including the function of pyridoxal-P) and metabolic location of the glutamate-αketoglytarate, aspartate-oxaloacetate and alaninepyruvate reaction.

111. Describe the function of glutamic dehydrogenase in NH_3 fixation and gluconeogenesis.

GLUCONEOGENESIS

112. Describe why amino acids do, and fatty acids do not, support net gluconeogenesis.

113. Recognize the pyruvate carboxylase and PEP carboxykinase reactions, and illustrate their function both in gluconeogensis and in replenishing citric acid cycle intermediates.

114. Recognize the irreversible steps in glycolysis and their gluconeogenetic bypasses.

115. Recall the function of ketone bodies in sparing gluconeogenesis, and identify their source.

UREA CYCLE

116. Recall that NH_3 is disposed of by urea formation.

117. Outline the pathway of formation.

118. Recognize the interrelation with gluconeogenesis from amino acids.

TAY-SACHS DISEASE

119. Recognize the general structure of sphingolipids.

120. Recall general pathways of biosynthesis and degradation.

121. Recognize the general type of defect in sphingolipodases and their cellular location.

122. Discuss the societal aspects of the disease.

PURINE METABOLISM

123. Identify the metabolic precursors of purine biosynthesis.

124. Describe the function of folic acid coenzymes and describe the action of folic acid antagonists and sulfonamides.

125. List the major glutamine-dependent amination reactions, and recognize why glutamine antagonists are highly toxic.

126. Recognize the enzyme defect in Lesch-Nyhan and recall the biochemical consequences.

CMB

MECHANISMS OF CELLULAR REPLICATION AND INHERITANCE - GENERAL PRINCIPLES

127. Define gene, mutation, cistron, genetic recombination, gene linkage and suppression, and describe the mechanisms of suppression at the molecular level.

128. Construct a genetic map for cells with one chromosome and for cells with more than one chromosome.

MUTATION

129. Describe the ways in which the base sequence of DNA can be altered (such as by base substitutions, deletions, additions, frame-shifts, rearrangements, duplications, etc.).

130. Describe the action of the best-known classes of mutogenic chemical agents.

131. Describe the mechanism of mutations induced by ultra-violet light and x-rays.

132. Describe the different expressions of nonsense mutations and missense mutations.

BACTERIAL GENETICS - GENETIC TRANSFER

133. Contrast the difference between conjugation, transduction and transformation.

134. Describe the consequences of the integration of new genetic material into the host cell genome (at the molecular level).

135. Explain the role of extrachromosomal genetic elements in gene expression and in transfer of genetic information.

BACTERIOPHAGE GENETICS

136. Describe the meaning of prophage, vegetative phage, virulent and lysogenic phage, conditional lethal mutation and host-dependent mutation.

137. Describe the sequence of events during infection by a virulent phage, including the role of surface receptors.

138. Describe the sequence of events during infection by a lysogenic phage including the factors involved in maintenance of lysogeny and induction of prophage.

139. Describe the mechanism by which lysogeny can result in alteration of host cell characteristics.

140. Calculate the probability of an event which follows a standard or a Poisson distribution.

141. Interpret exponential decay curves.

EUCARYOTIC CELL GENETICS

142. Define the "gene" in terms of its: clinical significance, biological significance, and chemical and molecular significance.

143. Explain and define the terms: gene locus, allele, character, trait, genotype, phenotype, homozygote, cell fusion, heterokaryous, hybrid cells, cell activation, virus rescue, interallelic complementation.

144. Define the following terms associated with human karyotype, both normal and abnormal: euploid, aneuploid, trisomy, triploid, titaploid, endoreduplication, and modal number.

145. Define, using relevant clinical examples, the following terms: expressivity, variable expressivity, syndrome, pleiotropic effect, sex limitation, genetic heterogeneity, and consanguinity.

146. Explain the concept of dominance given a clinical trait expressed at a single gene locus, recessiveness and co-dominance.

147. Explain the mendelian principles of: random segregation and independent assortment.

148. Construct a genetic pedigree from a family history and its medical disorders according to the symbolic guidelines presented in the syllabus.

149. Given a medical history, appropriate laboratory tests and a genetic pedigree, interpret within the limits of the data the type of inheritance pattern represented by autosomal dominance, autosomal recessive, sex-linked recessive, sex-linked dominant.

150. Calculate the probability of recurrance risk to future pregnancies in each of the following types of inheritance patterns: autosomal dominant, autosomal recessive, sex-linked dominant, and sex-linked recessive.

151. Explain the rationale behind: developing a selective (e.g., HAT) medium, studying cell cycle control through heterokaryous, chromosome mapping.

152. Describe the biochemical basis of: normal <u>in vitro</u> heterkaryous as in muscle development, regulation of differentiated functions (dominant versus recessive functions) drug resistance, amino acid auxotrophy, temperature sensitivity for growth.

GENETIC ENGINEERING

153. Recall the present abilities to perform aminocentesis as a basis for abortion and to provide mass genetic screening.

154. Recognize future possibilities for gene therapy via gene synthesis, cell hybrids, phage or SV40 transduction, in vitro fertilization and reimplantation, and cloning of organisms.

EUCARYOTIC CELL DIVISION, CELL CYCLE AND CHROMOSOMES

155. Diagram the process of meiosis and mitosis using two pair of chromosomes.

156. Meiosis: a) recognize prophase modifications and synaptinernal complex formation; b) describe the molecular basis for genetic recombination by crossing over; and c) describe the genetic consequences of meiosis with special regard for: 1. segregation of many pair of alleles; 2. crossing over; 3. linkage of genes; 4. recombinations.

157. Diagram the cell cycle, including the parameters G_1, S, G_2, and M and indicate the biochemical activities specific to each phase.

158. Describe the control of proliferation.

159. Identify the stages of the cell cycle from the results of a ^{3}H-TdR incorporation experiment.

160. Describe the morphologic characteristics of the X-chromosomes during interphase of the cell cycle and its relationship to genetic expression in terms of: a) sex chromatin; b) lyon hypothesis; and c) dosage compensation.

161. Recognize the morphologic characteristics of the chromosomes found in the various groups of the human karyotype: Groups A through G.

162. Differentiate between the following histochemical methods of chromosme identification: a) C-banding for constitutive heterochromatin; b) Q-banding following the use of the quinicine fluorochromes and c) G-banding using giemsa stain and enzymatic digestion ofthe chromosome with trypsin.

163. Define the coiled coil model, packing ratios, enchromatin, heterochromatin, gene families (redundancy, multiple copies of cistrans, satellite DNA), histones and acidic proteins, polytene and lamp brush chromosomes and control of gene expression and chromosome condensation.

164. Describe chromosome replication in terms of: semi-conservative, ordered and sequential, multiple inititation sites, rate of DNA synthesis relative to bacteria, control of initiation and maintenance.

165. Recall modern attempts to define the molecular basis for growth control, including cell surface modifications and the relevance to viral transformation.

CONTROL MECHANISMS - REPLICATION

166. Recall that replication control mechanisms exist even though they are not understood at present.

TRANSCRIPTION AND TRANSLATION

167. Distinguish between regulation of enzyme synthesis and the regulation of specific enzyme activity.

168. Define operon, structural gene, regulation gene, repressor, promotor, polarity and catabolite repression.

169. Explain induction and repression.

170. Describe the role of cAMP in catabolite repression and the control of protein synthesis.

POST-TRANSLATIONAL CONTROL

171. Qualitatively predict mass action effects on enzymatic reactions.

172. Recall the importance of environmental effects (pH, temperature, ionic strength, etc.).

173. Describe (using a specific example) the following major biological mechanisms for modulating enzyme activity: specific proteolysis (zymogen activation); reversible phosphorylation; the general role of cAMP-dependent protein kinases; allosteric activation and inhibition by effector binding. In your description, be sure to explain the concepts of feedback inhibition and energy charge, recall the control advantage of cooperative saturation kinetics, and recall the importance of protein conformation changes to cooperative interactions.

174. Binding of Oxygen to Hemoglobin: a) describe the molecular basis for the action of 2, 3-diphosphoglycerate and protons (changes in pH); b) describe the relationship between the concentration of CO_2 in blood and the pH; recognize the potential for changes in oxygen binding with changes in primary structure (mutations).

A Note

For several years CMB has been running without significant changes. Although there is no apparent need for major changes, CUME has asked for a review of teaching committee activities and now may be a good time to review what is being done in this committee.

This is not an attempt to define core, but rather a description of what we did this past year. I will leave the definition of core to a group which has a larger view of undergraduate medical education and the needs of health professionals. I have tried to make this description both readable and informative, something between the CMB syllabus introduction and the syllabus itself. There are some gaps in a few areas which received a significant amount of instructional time but little or no mention in this outline. So this must be regarded as a first attempt which can be improved if it proves useful.

Appreciation is due Drs. Cooperstein, Osborn, Pfeiffer and Rothfield for most of the work on this outline and to those lecturers who had clearly defined objectives in the syllabus.

Gene Wampler
April 15, 1974

Modified by Craig Gjerde on May 20, 1974

cm

University of Connecticut Health Center
Committee on the Curriculum

Subject Committee Chairman: C. Phelps
Curriculum Committee Chairman: C. Gjerde

CENTRAL NERVOUS SYSTEM

EDUCATIONAL GOALS AND OBJECTIVES

GOALS

* Describe the nervous system; compare and contrast the nervous system with other organ systems.

* Recognize the complexity and diversity of function of the nervous system in relation to the simplicity of structural elements (i.e., neurons and their interconnections).

* Faced with a given set of neurological circumstances, eliminate inappropriate causes, choose appropriate methods for diagnosis, and arrive at a realistic hypothesis of the causes.

* Recognize that for most physiological occurences in the system, there is a biochemical and morphological substrate and that pharmacological and pathological modification of either the biochemical or morphological substrate results in a change of function.

* Recognize that pathological states in the nervous system (either functional or organic) stem from or are influenced by basic changes in either the anatomy, physiology, biochemistry, or a combination of these.

* Understand how the central nervous system interrelates with the other organ systems in the body.

* Understand how the central nervous system interrelates the outside world.

OBJECTIVES

1. List the cranial nerves, identify their functions, origins, terminations, where they exit from the brain and the skull, their relationships to other brain structures, and their interconnections with brain centers.

2. List the major subdivisions of the brain and identify their embryonic origin.

3. Describe the appropriate stimulus, the preferred pathway, the points of synapse, the location of neuronal cell bodies, and the cortical localization of the primary sensory modalities (pain, temperature, discriminative and crude tactile, conscious and unconscious proprioception, vision, hearing, taste, smell, visceral sensation).

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4. Explain the myotatic (stretch reflex) and how it is influenced by higher centers.

5. Describe the role of the cerebellum on motor activity and its relationship to the cerebral cortex, thalamus, the basal ganglia, the brain stem, and the spinal cord.

6. Discuss the role of the basal ganglia in motor function and their relationship to the cerebral cortex, thalamus, the brain stem, the cerebellum, and the spinal cord.

7. Explain how the cerebral cortex participates in motor activity, both in fine or discriminative types of movement and in crude movements involving groups of muscles.

8. Identify those brain centers which influence primarily extensor movements versus those which influence primarily flexor movements; recognize, in turn, what controls exist for modifying activity in these centers.

9. Describe the formation, circulation through the ventricular system and the subarachnoid space, and the reabsorption of cerebral spinal fluid.

10. Describe as specifically as possible the arterial blood supply to all portions of the brain and spinal cord.

11. Describe the venous drainage of the brain including all possibilities.

12. Explain the primary differences between neurons and neuroglia from a morphological as well as a pathological view.

13. Discuss the concept of the generalized vertibrate neuron -- including receptor, conductor, and effector function.

14. Discuss the sulcus limitans and its relationship to motor and sensory development of the spinal cord and brain stem — including the adult relationship.

15. Discuss the gross anatomical aspects of the spinal cord including its relationships to (a) the meninges, (b) its vascular supply, (c) the vertebral column, (d) the spinal nerve roots, and (e) the antonomic nervous system.

16. Discuss these problems encountered primarily when dealing with the biochemistry of the central nervous system (e.g., cell separation).

17. Explain the current level of understanding regarding memory and its relationship to biochemistry and physiology.

18. Describe the synapse — integrating knowledge gained from morphology, physiology and biochemistry.

19. Discuss current theories of the biological basis for affective disorders.

20. Discuss the determinants of motor tone and list the major pathological conditions which can lead to hypotonia and hypertonia.

21. Discuss the etiology, diagnosis, and prognosis of schizopherenia.

22. Describe defense mechanisms and their relationship to symptom formation.

23. Discuss the important principles of the pharmacology of the spinal cord.

24. Explain how observations of behavior can be quantified (e.g., the SAID program).

25. Describe delerium and toxic states.

26. Discuss cerebral blood flow in normal and pathological states.

27. Analyze current theories relating brain function with (a) intelligence, (b) the mind, and (c) consciousness.

28. Describe the roles of the thalamus and cerebral cortex in the processing of sensory input.

29. List the seven function components of the cranial nerves and describe the basis for the classification scheme.

30. Discuss the general sensory innervation of the head including the central pathways.

31. Describe the sensory (special and general) and motor innervation of the oral cavity.

32. Discuss the anatomical and physiological basis for taste and smell.

33. Describe the neurological basis for conscious and reflex conjugate deviation of the eye.

34. Describe the role of the antonomic nervous system in accommodation, myosis, and mydriasis.

35. Describe the structure and functional basis for binocular vision.

(Unfinished)

EDUCATIONAL GOALS AND OBJECTIVES

GOALS

PELVIC AND PERINEAL ANATOMY

* Understand the anatomy of both sexes.

* Build a three dimensional figure of each sex in your mind.

* Understand the continuity between pelvis - perineum and the abdomen and lower extremities.

* Understand functional anatomy - e.g., effects of pregnancy, sex organs.

* Recognize the wide range of normal variation in anatomy.

OBJECTIVES

PELVIC AND PERINEAL ANATOMY

1. Construct a pelvic model.

2. Identify a pelvis or skeleton as male or female.

3. Identify a given section of bone (e.g., anterior iliac crest) and describe its anatomical relationships (e.g., muscle attachments, neural pathways, vascular patterns).

4. Describe and demonstrate on the body the anatomical relationships of the major organs and structures (e.g., the vas deferens, the normal female uterus, Colles' fascia, clitoris).

5. Describe the embryology and development of the genital systems from fetus to maturation.

6. Recognize the mammary glands as subcutaneous structures; describe the blood supply and lymphatic drainage.

DIABETES MELLITUS AND HYPOGLYCEMIA

7. List the major steps in the biosynthesis and secretion of insulin.

8. Describe some factors which increase and decrease the biosynthesis and secretion of insulin.

9. Describe the action of insulin on various tissues, especially liver, muscle, adipose tissue.

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ER

10. Discuss the relation of insulin action to the action of growth hormone, glucagen, and epinephrine.

11. List the series of metabolic events which lead to the production of excessive amounts of ketoacids in diabetic ketoacidosis.

12. Explain the chemical consequences of metabolic acidosis, especially the fluid and electrolyte disorders.

13. Explain the major theories regarding the pathogenesis of diabetes.

14. Distinguish between early onset (insulin dependent) diabetes and late onset (non-insulin dependent) diabetes. State the apparent incidence of diabetes mellitus in this population.

15. Describe the major late complications of diabetes and explain some of the theories regarding their pathogenesis.

16. Describe the metabolic and hormonal factors that control the level of blood glucose and explain the system of carbohydrate homeostasis.

17. Analyze the symptoms and signs in a poorly controlled or uncontrolled "new" diabetic in terms of failure of carbohydrate regulation.

18. Propose a method of treatment based on physiologic principles of: a) non-insulin dependent diabetes, b) insulin dependent diabetes, and c) diabetic ketoacidosis.

19. Explain the consequences of hypoglycemia on the central nervous system.

20. Explain how hypoglycemia can occur following rapid carbohydrate absorption, in early diabetes, in disorders of liver function, following ingestion or administration of certain amino acids, in certain hereditary enzyme deficient states, with pancreatic insulinomas, with non-endocrine tumors, and in endocrine deficient states such as Addison's Disease or hypopituitarism.

GOAL

DIABETES INSIPIDUS AND INAPPROPRIATE ADH

* Understand the control of water conservation of the body--the hormonal control for concentration of urine in the human.

OBJECTIVES

DIABETES INSIPIDUS AND INAPPROPRIATE ADH

21. Describe the stimuli to ADH secretion and the stimuli for thirst.

22. Locate the site of each stimulus; describe the physiological changes which evolve the stimuli and locate the hypothalamus.

ER

23. Recognize the drugs which stimulate, inhibit, or alter the secretion or renal effects of ADH.

24. Distinguish between the fine control of ADH and the imprecise control of thirst in man and recognize the importance that this difference has in the maintenance of fluid homeostasis.

25. Explain the renal mechanism for the concentration of fluid and describe how ADH conserves fluid via this mechanism.

26. Recall the normal range of serum osmolarity on the human and explain the effects of either high concentrations of solute or very dilute concentrations of solute on renal fluid and solute excretion.

27. Recognize the clinical syndromes which can lead to excessive and inappropriate secretions of ADH.

28. Identify the tissues outside the hypothalamus which have been reported capable of elaborating ADH.

29. Categorize the causes of excess fluid secretion which are not dependent on ADH.

30. List the physiologic stimuli which cause appropriate increased secretion of ADH.

31. List the clinical syndromes which are associated with absent secretion of ADH.

PARAENDOCRINE

32. List the hormones which can be produced by non-endocrine tumors.

33. Distinguish how the clinical presentations of paraendocrine tumors differ from the clinical presentations of hormone excess originating from the appropriate endocrine gland.

REPRODUCTIVE NEUROENDOCRINOLOGY

34. Describe the vascular connections between the pituitary and hypothalamus and how this system translates neuronal signals into pituitary-hormonal discharges. Recall the vascular supply to the hypothalamic-pituitary axis and illustrate the hypothalamic-pituitary portal vessel system.

35. Recognize that there are hypothalamic and pituitary sites of feedback control which influence the final discharge of gonadotrophins.

36. Recall the structure of the synthetic hypothalamic hormone which causes gonadotrophin release.

37. Name the pituitary gonadotrophins and state their functions in the male and in the female.

ER

38. Name the gonadal hormones and state their effects on growth and sexual development.

39. Explain the maturation of the feedback regulation system for gonadotrophin secretion from infancy to adulthood.

40. List the sequence of hormonal changes in the human which lead to ovulation and the sebusequent hormonal changes which result in menstruation.

(Unfinished)

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University of Connecticut Health Center
Committee on the Curriculum

Subject Committee Chairmen: D. Watkins and R. Rossor
Curriculum Committee Chairman: C. Gjerde GASTROINTESTINAL

EDUCATIONAL GOALS AND OBJECTIVES

OBJECTIVES

EMBRYOLOGY

1. Constrast parietal with visceral peritoneum.

2. Define a mesentary.

3. Locate the various portions of the gastrointestinal tract in the abdominal cavity.

4. Explain how the celomic cavity is formed.

5. Explain where the epithelium, smooth muscle, visceral peritoneum, parietal peritoneum, muscle of the anterior abdominal wall, and skin are derived from in regard to ectoderm, entoderm, and mesoderm.

6. Explain gut rotation in the development of the digestive tract.

7. Explain the development of liver, bile duct, and gall bladder.

8. Explain the development of the pancreas.

HISTOLOGY

9. Identify the major layers of the gastrointestinal tract.

10. Define mucous membrane.

11. Relate the type of epithelium to function (e.g., stratified squamous epithelium is for protection).

12. List the type of glands found in the mucous membrane.

13. Distinguish esophageal cardiac glands from esophageal glands.

14. Distinguish on a slide the upper, middle, and lower thirds of the esophagus.

15. List the functions of the stomach.

16. Identify the areas of the stomach.

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17. Distinguish a gastric pit from a gastric gland.

18. Compare the cell types found in the glands (e.g., parietal cells, mucous neck cells, chief cells, and argentaffine cells).

19. List the functions of the small intestine.

20. Discuss how the structure of the small intestine has become adapted to perform its functions.

21. Distinguish between a villus and a gland (crypt of Liebeskuhn).

22. Compare the types of cells found in the small intestine (e.g., goblet cells, absorptive cells, argentaffine cells, paneth cells).

23. Distinguish duodenum from jejunum and ileum.

24. Compare the epithelium of the large intestine with that of the small intestine (e.g., presence of villi, paneth cells, folds).

25. Explain the blood supply to the liver

26. Compare the exocrine function with endocrine function.

27. Distinguish the classic lobule from the acinus lobule.

28. List the structures found in the portal area of the liver.

29. Discuss how the structure of the liver has become adapted to perform its functions.

30. Distinguish gall bladder from stomach and small intestine.

31. Distinguish the exocrine portion of the pancreas from the endocrine portion in terms of morphology and histology.

32. Distinguish the pancreas from caryotid gland.

33. Identify the sensory nerve distribution to the anterior abdominal wall.

34. Describe the use of nerve distribution in the anterior abdominal wall in determining the effects of spinal anesthesia.

35. Identify the muscles which make up the anterior abdominal wall (e.g., exterior and interior oblique, transversus muscle, rectus abdominus).

36. Distinguish an indirect hernia from a direct hernia.

37. Compare the layers of the anterior abdominal wall with the layers in the scrotum.

38. Describe how the coverings of the spermatic cord are formed.

39. Describe how the inguinal canal is formed.

40. List the structures which run in the lesser omentum.

41. List the structures which form the boundaries of the epiploic foramen of Winslow.

42. Identify the median, medial, and lateral umbilical ligaments and identify what fetal structures they represent.

43. Identify the falciform and round ligaments of the liver and identify what fetal structures they represent.

44. Identify the triangular and coronary ligaments of the liver.

45. Distinguish the small intestine from the colon in regard to gross appearance.

46. List the parts of the gastrointestinal tract which are retroperitoneum.

47. Identify the ducts from the liver (e.g., right and left hepatic duct, common hepatic duct, common bile duct).

48. Identify the branches of the common hepatic artery.

49. Identify the portal vein and discuss its formation

50. Identify the arteries to the stomach (e.g, left and right gastric, right and left gastroepeploic, and short gastrics).

51. Discuss the effects of ligation of a main artery on gastric function.

52. Identify anterior and posterior vegal trunk.

53. Describe the boundaries of the omental bursa.

54. Identify the three major arteries from the celiac trunk.

55. Identify the lobes of the liver and their relation to the porta, ligamentum venosum, fossa for the gallbladder, and fossa for the inferior vena cava.

56. Describe the location of the spleen in the abdominal cavity.

57. Distinguish the jejunum from the ileum in regard to gross appearance.

58. Identify the branches of the superior mesenteric artery (e.g., ileocolic, right colic, middle colic, jejunal, and ileal).

59. Identify the branches of inferior mesenteric artery (e.g., left colic, sigmoid, and superior rectal).

60. Discuss the openings of the common bile duct and main pancreatic duct into the duodenum.

61. Identify the branches of the splenic, gastroduodenal, and superior mesenteric arteries into the duodenum and pancreas.

62. List the structures which pass through the diaphragm and which pass behind the diaphragm.

63. Identify the splanchnic nerves; discuss which structures form the ciliac, superior mesenteric, and inferior mesenteric plexuses.

64. Identify the thoracic duct.

65. Describe the role of the duodenum in achieving osmotic equilibrium.

66. Explain the concept of net movement of water and solute as a resultant of bidirectional fluxes.

67. Discuss the course of sodium absorption in the duodenum, jejunum, and ileum.

68. Explain the absorption of potassium and choloride and the secretion of bicarbonate in the intestine.

69. Describe the absorption and excretion of iron by the gut.

70. Explain absorption of vitamin B_{12}

71. List the major causes of diarrhea.

72. Define and contrast the active and passive absorption of monosaccharides.

73. Discuss the absorption of amino acids and the effects of deficiency in amino acid transport system.

74. Discuss the nature of small-intestinal motility and factors regulating it, including segmentation and its distinction from peristalsis; gradient of small-intestinal motility; the relation of segmentation to basic electrical rhythm; and peristaltic and peristaltic rushes.

75. Distinguish between oxyntic and pyloric glandular mucosas.

76. Explain the secretions of oxyntic glandular mucosa.

77. Explain the action of pepsinogen and its conversion to pepsin.

78. Describe the composition of acid secretion of onxyntic glandular mucosa; relate changes in composition to rate of secretion.

79. List possible causes of variation in composition of acid into mucosa.

80. Define the potential difference across gastric mucosa and usefulness of measuring it.

81. Define the gastric mucosal barrier.

82. List the consequences of back diffusion of acid into mucosa.

83. Discuss the secretions of pyloric glandular mucosa.

84. Distinguish between the aqueous and enzyme components of pancreatic juice.

85. Explain the composition of aqueous component as a function of its rate of secretion.

86. Define secretin and describe the factors governing its release from duodenal mucosa.

87. Relate the rate of acid delivery to duodenum with the rate of secretion of aqueous component.

88. Define pancreozymin.

89. List the major stimuli for release of pancreozymin from duodenal mucosa.

90. Recognize that the aqueous component of bile is similar in composition and control to the aqueous phase of pancreatic juice.

91. Describe normal enerophepatic circulation of bile acids including: secretion by liver, interdigestive sequestration in gall bladder, delivery to intestinal tract, passive absorption, active absorption in terminal ileum, and transfer by portal blood to liver.

92. Explain the reabsorption of salts and water by gallbladder.

93. Describe compostion of hepatic and gallbladder bile.

94. Define micelle.

95. Describe bile acids in terms of: the magnitude of pool size in normal persons, the turnover rate in normal persons, the daily loss in normal persons, synthesis of bile acids equated with loss, negative feedback regulation of synthesis, and the effects of graded losses on pool size and rate of synthesis.

96. In intestinal secretion, describe the functions of: Brunner's glands, the cycle of cell proliferation and desquamation, and the presence of enzymes in intestinal juice.

97. Explain the cephalic phase of gastric secretion.

98. Define "Sham feeding."

99. Describe effect and pathway of action of insulin hypoglycemia on gastric secretion.

100. Explain the effect of distention of stomach on gastric secretion.

101. Describe gastrin, and explain its source, factors regulating its release and its major effects.

102. Describe pentagastrin and explain its major effects.

103. Recognize that in using pentagastrin the amount of acid secreted is directly proportional to amount of protein in diet.

104. Describe cholecystokinin-pancreozymin, list its major effects, and compare it to gastrin.

105. Describe secretin, list its major effects and compare it to glucogen.

106. Explain the mechanisms by which gastric secretion is inhibited.

ORAL CAVITY

107. Recognize the normal and abnormal gross morphology of the oral cavity and related structures necessary to the performance of an oro-facial examination of children and aduts (e.g., osteology of the face and jaws, location and functions of the muscles of mastication, innervation and blood supply of the oral cavity and face, location of the salivary glands and their ducts, structure and function of the temporomandibular joint).

108. Identify microscopically the various regions of oral mucous membrane, including the tongue, salivary glands, the dental hard tissues, the dental pulp, the peridontal ligament, the gingiva, and the stages in tooth development.

109. Distinguish malignant and nonmalignant lesions of the oral cavity; distinguish primary lesions from those secondary to a systemic disease; identify the immediate risk to the patient, and the appropriate referral route, and the appropriateness of the proposed treatment.

110. Recognize normal and abnormal salivary gland function; describe the rationale for the treatment of abnormal function.

111. Explain the etiology, pathogenesis, and sequelae of periodontal disease and caries, and describe their treatments.

112. Maintain personal oral hygiene.

113. Recognize poor oral hygiene in patients and refer them for further treatment and education.

LIVER - BILIARY TRACT

114. Recognize the normal anatomy of the liver and biliary tract, grossly and by light microscopy.

115. Recognize the function of the normal hepatocyte, regarding its role in glucose homeostasis, protein synthesis, lipid metabolism, and as an excretory tissue regarding drug metabolism and the metabolism of some internally produced materials such as bilirubin.

116. Describe the etiology of the various acute hepatitidies and describe and/or recognize the clinical, biochemical and morphologic (both gross and histopathological) differences between viral, drug, and toxic.

117. Describe the changes in hepatic function which would be associated with viral, drug, toxic hepatitis; describe the pathogenesis of the changes.

118. Describe and recognize what occurs with hepatic cell injury at the light and electron microscope level.

119. Relate the ultrastructural change through liver cell injury to functional changes.

120. Describe the various chronic liver diseases (i.e., cirrhosis); identify their etiologies, and describe and recognize the clinical, biochemical, and morphologic (both gross and histopathological) differences between Laennec's postnecrotic, and biliary.

121. Describe the changes in hepatic function which may be associated with these entities (Laennec's, postnecrotic, and biliary cirrhosis) and the pathogenesis of the changes.

122. Describe and recognize the development of fibrosis in its various patterns.

123. Recognize and find additional information when needed about the broad spectrum of viral, bacterial, and chemical causes of some cases of acute hepatitis: (i.e., infectious mononucleosis, psittacosis, pylonephritis, pneumococcus, amanita phalloides and yellow phosphorous.

124. Recognize and find additional information when needed about the broad spectrum of chronic liver diseases: cardiac cirrhosis, syphyllis, hemochromotosis, and Wilson's disease.

125. Describe the relationship of HBAg to hepatitis B and describe the changes in surface and core antigens and antibodies to these antigens during the course of hepatitis B infection.

126. Describe the pathogenesis of fatty infiltration of the liver.

127. Identify alcoholic hyalin under the light and electron microscope.

128. Describe and recognize on a slide primary liver tumors and diseases with which they may be associated.

129. Describe the pathogenesis of portal hypertension.

130. Describe the veins through which collateral circulation occurs.

131. Describe the mechanisms of fluid accumulation in liver disease.

132. Describe the pathogenesis of hepatic encephalopathy.

133. Describe the biochemical and histopathologic changes that occur in chronic active liver disease.

GI

134. Describe the function of the normal gallbladder.

135. Describe bile composition.

136. Describe the pathogenesis of cholestrol gallstone formation.

137. Describe the factors regulating bile flow.

138. Recognize that attitudinal and psychological skills must be developed in order to effectively deliver the only known therapy for alchoholic liver diseases--getting the patient to stop drinking.

GOALS

NUTRITION

* Be familiar with basic nutritional knowledge.

* Apply basic nutritional knowledge by counselling patients regarding food practices.

OBJECTIVES

139. List some factors which affect the requirements for dietary intake of vitamins.

140. Given the name of a vitamin, state its use in the body and its mechanism of action.

141. List the macronutrients, specify their amount and location in the body, and describe the consequence of insufficiency or excess.

142. Define basal metabolism.

143. For each of the common minerals, list a dietary source, the daily requirements, and the consequences of deficiency.

144. Name four major vitamin-dificiency diseases, the associated deficient vitamin, and dietary sources of that vitamin.

145. State an opinion about vitamin usage.

146. Specify some chronic diseases where nutrient needs are a component of therapy, describe the etiology (where known), and explain the dietary precautions to be taken.

147. Discuss ethnic, economic, cultural, and ideological factors which influence nutritional intake.

148. Formulate a procedure for diet management.

149. Given a daily food list, calculate the number of calories and the amounts of protein, sodium, and iron.

150. Given a table of dietary values, construct a balanced daily diet for an adult male or female.

151. Describe the major restricted diets.

PATHOLOGY
LIVER TUMORS - BALLBLADDER - PANCREAS

152. Discuss hepatocellular carcinoma - the etiology, morphology, and alphafetoprotein production.

153. Discuss gall stones and their related problems (cholecystitis and gallbladder carcinoma).

154. Describe the etiology and pathogenesis of acute pancreatitis.

155. Discuss the pathology of fibrocystic disease of the pancreas and relate it to the involvement of other organs in this syndrome. Explain some of the biochemical disturbances, the incidence of the disease, and its treatment.

156. Discuss carcinoma of the pancreas - its incidence, morphology, and clinical presentation (related to the location of the tumor).

SMALL INTESTINE AND LARGE INTESTINE

157. Discuss the differential diagnosis of regional enterities and ulcerative colitis.

158. Discuss the etiology and pathology of diverticulosis of colon.

159. Describe various hernias.

160. List the most common causes of paralytic and mechanic ileus.

161. Discuss the presentation and pathology of carcinoma of large intestine in various locations.

162. Discuss acute appendicitis, including the salient features of pathology related to clinical presentation.

163. Explain the pathogenesis of hemorrhoids.

164. Describe the pathology of malabsorption syndromes.

165. Discuss the etiology and pathology of pseudomembranous colitis.

166 Describe the bacillary inflammations of small and large intestine - typhoid, tuberculosis, cholera.

ESOPHAGUS AND STOMACH

167. Describe congenital lesions of the esophagus.

168. Explain hiatal hernia.

169. Distinguish diverticula of esophagus on the basis of location, shape, and pathogenesis.

170. Describe the etiology of esophagitis.

171. Describe the pathogenesis of esophageal varices.

172. Discuss esophageal carcinoma: the incidence, gross and microscopic pathology, and clinical presentation.

173. Explain the pathogenesis, gross and microscopic pathology and complications of peptic ulcers.

174. Discuss the gross and microscopic pathology of gastric carcinoma; discuss the epidemiology and possible etiologic factors.

175. Discuss the normal process of deglutition from mouth to esophagogastric junction.

176. Describe the muscular coats of the esophagus in its proximal, middle, and distal portions.

177. Describe the action and function of the upper and lower esophageal sphincters.

178. Explain the pathophysiology of the following conditions: achalesia, peptic esophagitis, and peptic stricture; suggest medical and surgical treatment for each condition.

University of Connecticut Health Center
Committee on the Curriculum

Subject Committee Chairmen: R. Greenstein, J. Werboff
Curriculum Committee Chairman: C. Gjerde GROWTH & DEVELOPMENT

EDUCATIONAL GOALS AND OBJECTIVES

OBJECTIVES

GENETICS AND EMBRYOLOGY

1. Explain and define polygenic inheritance with respect to (a) multiple alleles; (b) quantitative traits; (c) continuous variations; (d) multifactorial inheritance.

2. Given the general genetic classification of disease, characterize each of the components (single gene, polygenic, and chromosomal disorders) by its frequency range in the population and give two examples.

3. Given a known polygenic trait or disease, distinguish its inheritance pattern from that of one under single control; e.g., dominant or recessive pattern.

4. For each of these four major types of birth defects (e.g., genetic-chromosomal, infectuous, structural and mental) give appropriate examples which typify that category with regard to description, etiology, pathogenesis, occurence risk, and epidemiology.

5. Given a family in which a birth defect has occurred, describe the information necessary and the sequence and conditions under which one performs genetic counselling.

6. Given a genetic counselling situation, identify the major ehtical, moral, religious, and social issues which may influence that interaction.

7. Describe mechanisms and principles (with appropriate examples) of the normal fetal development; e.g., (a) fertilization, (b) cleavage, (c) gastrolation, induction.

8. Describe the origins of cell specificity and cell migration.

9. Given a specific example of development during organogenesis, determine the interaction between environmental and genetic factors involved in that process.

10. Describe the drvelopment of the immune system (humoral, cellular), beginning with the fetus and determining that early relationship to postnatal life.

11. Identify and discuss some of the family planning factors found among parents (e.g., personality, social role, economic status, family size) that lead to the unwanted child.

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12. Identify the consequences for the child of being unwanted.

13. State the principle components of Connecticut's abortion law.

GOALS

GROWTH

* Understand the interplay of the genetic, humoral and nutritional factors in the level control of the growth process at the cellular, organ, and whole organism level.

OBJECTIVES

14. Differentiate between hyperplasia and hypertrophy when describing cell and organ growth.

15. Distinguish between total organism growth and individual organ differentiation (e.g., the brain).

16. Describe the manner in which longitudinal and cross-sectional population growth curves are constructed and applied to populations.

17. Illustrate the manner in which growth curves are used in the evaluation of human growth.

18. Assess the major measures of developmental maturity (e.g., bone age, height age, dental age, weight age, head circumference) with regard to their ability to serve as indicators of normal growth.

19. Discuss the sequence of developmental events, the range of normal age of occurance, and the control mechanisms for the adolescent growth-sprout.

20. Classify any given growth problem into one of the six categories: inadequate intake; failure to assimilate; increased metabolism; failure to utilize; failure of stimulation; and organ resistance.

21. Define and distinguish among birthweight, gestational maturity, and chronological age.

22. Distinguish between small for gestational age, appropriate for gestational age, large for gestational age, true prematurity, and low birthweight infant.

23. Given a child who is small-for-dates, determine the fetal, maternal, and placental factors which may have contributed to the etiology.

24. List seven significant epidemiologic factors which contribute to the incidence of low birth weight babies.

25. Describe the impact of a low birth weight baby on the family, community, and society.

26. Describe the impact of a low birth weight on the growth and development of the infant.

27. Discuss the maternal deprivation syndrome as a model of the disturbance between biological and psychosocial stimulation in a child.

28. Describe the adverse effects of the following environmental factors on growth and development: malnutrition, lead, infection, pollution, overcrowding.

29. State the historical and environmental information you would require in evaluating a child from the ghetto who demonstrates growth retardation.

NEONATE

30. Explain the major theories of early social attachment (developed from animal and human experiments) which attempt to characterize the subsequent behavior of the individual.

31. Describe the major components of the maternal-infant relationship and discuss their influence on later development and behavior.

32. Describe the physiologic and biologic adjustments of the newborn (cardiovascular, respiratory, carbohydrate metabolism, thermal control, bilirubin metabolism) to the extra-uterine environment.

33. List the major development reflexes of the infant and the sequence of their acquisition and disappearance.

34. Describe the use of infantile (primitive) reflexes as a means of determining the neurological status and developmental maturity of the infant.

35. Given a specific neurologic function (e.g., walking), describe the relationship between CNS maturation (e.g., biochemical and physiological) and the anatomical development (e.g., histologic structure) of the brain.

36. Describe the anatomic structure and embryonic formation of the oral cavity.

37. Describe the anatomic structure and embryonic formation of the face and related structures.

38. Discuss the developmental sequence of tooth eruption in relationship to growth of the child.

39. Describe the environmental and biological factors which contribute to the production of the following: dental caries, malocclusion, and defects in tooth structure; suggest preventive and corrective measures.

PRE-SCHOOL

40. Describe the major developmental milestones of children at 24 and 48 months in terms of: (a) gross motor; (b) fine motor-adaptative; (c) language; (d) personal-social.

41. Describe the use of the Denver Developmental Screening Test, its applicability and standardization.

42. Given a group of normal children of the same age, account for their individual variations, with regard to CNS maturation, behavior and development, environmental interaction, and cognitive functioning.

43. Define cognitive functioning and identify the biologic and adaptive factors which influence it.

44. Describe the standardization and applicability of the WISC as a measure of intellectual functioning.

45. Describe the standardization and application of the Draw-A-Man test as a projectives measure of personality.

46. Distinguish between speech development and language development; describe speech development in terms of anatomical factors and mechanical events; describe language development.

47. Discuss the concept of "developmental lag" for a given child in relationship to normative levels of maturation in functioning as described in the Denver Developmetnal Screening Test.

48. Describe the effects of biological (e.g., hypothyroidism, PKU) and environmental (e.g., maternal, nutritional) deprivation on development.

49. Define learning disability and mental retardation and distinguish between the two.

ADOLESCENCE

50. Describe the developmental changes which take place at the adolescent growth spurt, specifically in the following areas: physical, endocrine, and psychosocial.

51. For both male and female describe the physical, endocrine, and psychosocial factors which influence the sequence and age variability of the adolescent growth spurt.

52. Describe the components of normal adolescent identity formation and describe their influence during early, middle and late adolescence.

53. Define negative identity.

54. Identify the major sources of identity conflict during adolescence.

G & D

55. Given an adolescent with a chronic medical illness (e.g., diabetes), discuss the biological and environmental factors which influence his behavior.

56. Distinguish among frank psychiatric illness (depression, psychosis), adolescent deviant behavior, and normal adolescent acting-out behavior.

MIDDLE YEARS

57. Identify the principal, biological, psychological, and social components of normal development in the middle years.

58. Describe the major physiologic and biologic changes of the middle years; e.g., endocrine, musculo-skeletal changes.

59. Identify the physical and biologic events in the middle years which influence changes in body image and self concept. Discuss the psychological adjustments which are made in response to those changes.

60. Describe the biological, social, and psychological factors which influence the behavior of an individual in the middle years when confronted by one of the following problems: heart disease, obesity, suicide, depression.

61. Given a health professional such as a dentist, scientist, or a physician, identify potential role conflicts which are frequently encountered throughout his or her professional life and career (e.g., spouse, parent, lover, boss, etc.

62. Utilizing the concept of psychosocial development in the middle years, apply it to the examination of your own personal, sexual, professional, and family life.

AGING

63. Identify the principal biologic, physiologic, psychologic, and social components of the aging process.

64. Determine your own attitudes as a health professional toward other people (through the aging semantic differential) and categorize the origins of these attitudes.

65. Discuss ways in which societal attitudes towards the aged affect the delivery of care (e.g., health insurance, social security, medical availability housing, and the extended family).

66. Given an aged individual with multiple disabilities, identify a complete problem list including environmental factors.

67. From your present vantage point, consider and discuss your own feelings toward the phenomenon of loss in aging.

DEATH & DYING

68. Analyze and discuss your own feelings about the impact of a fatal illness affecting a close friend, a patient, a family member, or yourself.

69. Identify the differences in the behaviors of individuals of various age groups facing death, e.g., a three-year old child dying from leukemia vs. the death of a 36 year-old adult dying from leukemia.

70. Identify the impact of the death of an individual on his family and environment (a fetus through abortion, the loss of a child through an acute or chronic problem, the loss of an adult through an acute or chronic problem).

71. Identify the occurence and alterations which denial and protest impose on the management of the dying patient.

72. Identify and discuss the interrelated nature of the following factors which at the time of a person's death significantly influence the care of the patient and his family: medical, legal, religious, psychosocial, and intra-family.

University of Connecticut Health Center
Committee on the Curriculum

Subject Committee Chairman: L. Hoyer
Curriculum Committee Chairman: C. Gjerde

HEMATOLOGY

EDUCATIONAL GOALS AND OBJECTIVES

OBJECTIVES

RED CELLS

1. Identify normal red cells on peripheral blood smears and characterize the major morphologic abnormalities, including cytoplasmic inclusions.

2. Describe the morphologic criteria that distinguish the stages of normal red blood cell development.

3. Define red cell indices and describe their use and limitations.

4. Discuss the roles of DNA, RNA, cytoplasmic enzymes, organelles and hemoglobin in the development and function of normal red cells.

5. Define the role of the following factors in control of blood cell production: erythropoietin, stem cells, hypoxia, and androgens.

6. Trace the fate of red blood cell breakdown products through their metabolic pathways.

7. Discuss the structure and function of hemoglobin, specifically including the oxygen dissociation curve, oxygen transport and the effect of 2, 3-DPG.

8. State a working definition of anemia, and discuss its physiologic implications.

9. Discuss the three major types of anemia due to lack of nutrients or their ineffective utilization (iron, vitamin B_{12}, folic acid). Describe the daily requirements and metabolism for each nutrient and indicate the means for identifying the anemias and their therapies.

10. Describe the different ways in which hemolytic anemias are caused by cellular and extracellular abnormalities, the methods available for their diagnosis, and their therapies.

11. Describe a stepwise clinical approach to diagnosis of anemias and recognize the difference between morphologic and physiologic classifications.

12. Discuss the nature of the defect of hemoglobin synthesis and their physiological implications in sickle cell disease, the thalassemic syndromes, the unstable hemoglobins, and hemoglobin variants with altered oxygen affinity.

13. Discuss the role of glycolysis and oxidative metabolism in red cells. Describe the effects on red cell function and survival of G-6-PD and PK deficiencies.

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14. Define polycythemia and differentiate the primary from the secondary form. Identify the physiologic bases of the secondary form.

15. Discuss the potential physiologic adaptations to tissue hypoxia.

WHITE CELLS

16. Recognize the maturation stages of granulocyte development and correlate them with the functional compartments.

17. Discuss the mechanisms by which the following factors regulate granulocyte production, release, and distribution: colony stimulating factor, leukocytosis, inducing factor, endotoxin, and epinephrine.

18. Discuss the physiologic role of granulocytes in phagocytosis and bacterial killing (e.g., chemotaxis, ingestion, functions of lysosomal and cytoplasmic enzymes), and explain defects of each function (e.g., chronic granulomatous disease, Chediak-Higashi syndrome, lazy-leukocyte syndrome).

19. Define neutropenia and describe its mechanisms and consequences.

20. Define and distinguish the four major kinds of leukemia (AML, ALL, CGL, CLL).

21. Describe the myeloproliferative disorders and their interrelationships.

22. Describe the clinical presentations of the acute leukemias and discuss the differential diagnosis of these leukemias.

23. Describe the categories of chemotherapeutic agents and discuss their mechanisms of action.

24. Describe the life cycle of human lymphocytes and explain the basis for the categorization into 2 subpopulations (B and T cell).

25. List the functions of B and T cells.

26. Describe the characteristic manifestations of the following lymphoid diseases: infectious mononucleosis, the lymphomas, multiple myeloma, macroglobulinemia. Distinguish their different effects on normal physiology.

HEMOSTASIS AND COAGULATIONS

27. Describe the interactions of the clotting factors in the coagulation cascade. Identify those clotting factors which act as substrates, enzymes, co-factors, or initiators.

28. Describe the interrelationships between fibrinolysis and coagulation.

29. Compare and contrast reactions of the enzymes thrombin and plasmin with the substrate fibrinogen.

30. Discuss the synthesis of the vitamin K dependent clotting factors -- including the effects of drugs and gastrointestinal diseases.

31. Describe how the following tests are done and which clotting factors they reflect (prothrombin time, partial thromboplastin time, thrombin time, euglobulin clot lysis time).

32. Discuss the molecular basis, genetics, and clinical presentation of the following diseases: classical hemophilia (hemophilia A), Christmas disease, Von Willebrands's disease, the dysfibrinogenemias, diseases of vitamin K deficiency, and disseminated intervascular coagulation.

33. Describe how each of the following agents interrupts or modifies the hemostasis and coagulation sequences: heparin, warfarin, aspirin, arvin, streptokinase, epsilin-aminocaproic acid, citrate.

34. Describe the sequence of events in primary hemostasis and discuss the the platelet release reaction.

35. Describe the life cycle of the platelet.

36. Describe how the following tests are done and which platelet abnormalities they can identify: clot retraction, bleeding time, platelet aggregation, platelet factor 3 release.

37. Discuss and contrast thrombocytopenia caused by diseases of reduced platelet production with that caused by diseases in which there is increased platelet destruction.

38. Discuss the physiologic basis, genetics and clinical presentation of the following diseases: Glanzmann's thrombasthenia, storage-pool disease, the aspirin-like disorder.

BLOOD TRANSFUSION

39. Contrast the ABO and Rh blood systems in respect to genetics, antigen structure, classes of antibodies formed, the usual conditions for their formation, and the kinds of tests used to identify these antibodies.

40. Discuss the pathophysiology, therapy and prevention of hemolytic disease of the newborn.

41. Explain the process of blood typing and cross-matching and indicate why the following complications of blood transfusion are not prevented by these steps: hepatitis, febrile reactions, development of irregular isoantibodies, thrombocytopenia.

42. Identify the individual components of whole blood which can be separated for specific administration and list the indications for use of each component.

43. Discuss the complications of massive transfusion therapy.

University of Connecticut Health Center
Committee on the Curriculum

Subject Committee Chairman: T. Joseph Sheehan
Curriculum Committee Chairman: C. Gjerde

INTRODUCTION TO BIOSTATISTICS

EDUCATIONAL GOALS AND OBJECTIVES

OBJECTIVES

UNIT 0

1. Classify research into prospective or retrospective designs.

2. Given the following points from the Schor article: 1, 5, 6, 8, 9, 10, 11, and 12, explain them in your own words. Or given a short example, identify the major faults according to Schor.

3. Given an experimental situation, point out common sense design flaws.

4. Given an experimental situation, state the questions which can be legitimately asked.

5. Given a poorly designed experimental situation, present rival plausable explanations for study results.

UNIT 1

6. Define the three measures of central tendency: mean, median, and mode.

7. Define the two measures of dispersion: variance and standard deviation.

8. Given a set of numbers, calculate both by hand and by using a calculator each of the following: mean, variance, and standard deviation.

9. State the essential parameters needed to define a normal curve.

10. Given the appropriate informatation, transform a raw score into its standard (Z) score and vice versa.

11. Translate values of Z to areas of the normal curve and vice versa.

12. Describe and contrast the three scales of measurement: nominal, ordinal, and interval.

UNIT 2

13. Given two events, determine if they are independent or dependent.

14. Given events A and B, apply the addition and product rules for calculating probabilities.

June 26, 1974

15. Given a situation, recognize whether or not a given variable is distributed binomially.

16. Calculate probabilities using the binomial formula.

17. Calculate the mean and variance of a binomial distribution.

18. Use the normal distribution to approximate binomial probabilities.

UNIT 3

19. Explain the relation of a sample to a population, a statistic to a parameter, and the meaning of statistical inference.

20. State a research hypothesis as a null hypothesis.

21. Explain the function of the Standard Error of the Mean as compared to the Standard Deviation.

22. Explain the role of the Standard Error of the Mean and use it in statistical hypothesis testing.

23. Distinguish between statistical significance and practical significance.

24. Determine whether an hypothesis to be tested calls for a one-tailed or two-tailed test.

25. Given a set of data, explain the meaning of either a Type I or Type II error for those data.

26. Compute and interpret the 95% and 99% confidence limits on an estimate of a population mean of sample size N.

27. State the assumptions underlying the Z test and perform that test on appropriate data.

UNIT 4

28. State the two underlying assumptions of the t-test.

29. Given the results of a study, including the value of t, make a valid statistical interpretation.

30. Given a study design, test the null hypothesis choosing the appropriate test from the following: a) uncorrelated group t-test, b) matched-pair t-test, c) one-sample t-test, and d) Z-test.

31. Use the t-table relative to the choice of a one or two-tailed test.

32. Calculate the confidence interval for the mean of a population and interpret the resulting statistical statement.

UNIT 5

33. Set up and calculate a Chi-Square test when an a priori hypothesis is available.

34. Set up and calculate a Chi-Square test when no prior hypotheses are available.

35. Interpret the results of a Chi-Square.

36. Tell whether the Yates correction factor is appropriate in a given case.

37. Describe the kind of events for which the Poisson distribution would be appropriate.

38. Calculate the probability of an isolated event and the confidence interval of a count.

39. Determine when to use, then calculate and interpret the following non-parametric tests: a) the sign test for matched pairs, b) the Wilcoxon test for unpaired data, and c) the test for runs.

UNIT 6

40. Given an assumption associated with ANOVA, such as homogeneity of variance, additivity of effects, or the random distribution of error, explain its meaning and importance.

41. Given an experimental study, tell whether the design is single classification (completely randomized), randomized blocks, or factorial.

42. Given ANOVA symbols such as:

$$\Sigma X^2 - \frac{(\Sigma X)^2}{N} \quad \text{or} \quad \frac{(\Sigma X_{mp})^2}{K_{mp}}$$

tell what they mean.

43. Perform the calculations (using the desk calculator, PLATO, or UIL if you wish), explain what the calculations mean, and interpret the results of: a one-way analysis of variance, a randomized block design, and a two-way factorial design.

44. Plot interactions from a two-way ANOVA and interpret the interaction effects.

UNIT 7

45. Given a scatter diagram, identify correlations approaching 1.0, -1.0, and 0.

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46. Given a set of paired data, compute the correlation coefficient and the regression coefficients. Test the correlation coefficient for significance. If the correlation coefficient is significant, graph the regression line, plot the original data points, and compute a 95% confidence interval for a predicted Y, given X.

47. Given a published article, identify the following abuses in the use of correlation: 1) correlation of averages, 2) utilizing a regression equation when the correlation between x and y is not significant, 3) assuming that the regression of y on x is the same as the regression of x on y, 4) lack of awareness of excessive deviations from normality, 5) attributing causation on the basis of high correlations, 6) incorrect assumption of linearity, and 7) extrapolation beyond allowable limits.

48. Interpret sensitivity and specificity in terms of prevelance and predictive power.

University of Connecticut Health Center
Committee on the Curriculum

Subject Committee Chairman: J.E.C. Walker
Curriculum Committee Chairman: C. Gjerde

INTRODUCTION TO
CLINICAL MEDICINE I

EDUCATIONAL GOALS AND OBJECTIVES

OBJECTIVES

INTERVIEWING

1. Establish a positive relationship with the patient.

2. Put the patient at ease and evoke his/her cooperation.

3. Display sensitivity, empathy, and concern for the patient.

4. Show sensitivity to and respect for patients' values and attitudes.

5. Adjust his language to the patient's level to insure that questions and responses will be understood.

6. Show sensitivity to language and communication problems that may bias data.

7. Use and receive non-verbal communication in patient contact.

8. Use open and closed coded questions, probing and directing, as well as "reminding" questions; avoid leading questions.

9. Use pacing (appropriate balance of flexibility and control), silence, and reinforcement techniques in data collection.

10. Collect all appropriate data.

11. Avoid premature speculation.

12. Assess the validity of information given by the patient.

HISTORY

13. Identify the "principle problem" in the patient's terms, using quotations wherever possible.

14. Amplify the chief complaint in the present illness, describing the symptoms chronologically and their relationships (e.g., nature, severity, duration of pain, sources of relief, prior care).

15. Identify positive and negative findings in the following systems: general, HENT, eyes, musclo-skeletal, central nervous system, and mental status.

15 October, 1974

16. Collect appropriate social data from the following categories: usual daily activities, employment history, home life situation, cultural beliefs about illness, adequacy of financial support for costs, school information where appropriate.

17. Construct a family medical history which includes genetically-related disease among blood relatives and contagious disease in family contacts.

18. Organize history data for easy retrievability.

PHYSICAL EXAMINATION

19. Prepare the patient for contact and then touch the patient gently and precisely.

20. Position the patient correctly for use of the instruments and correctly use the stethoscope, tuning fork, blood pressure cuff, measuring tape, otoscope, ophthalmoscope, tongue blade, and reflex hammer.

21. Identify and record blood pressure, pulse, and respiration.

22. Describe the patient's general appearance and demeanor.

23. Identify and describe HENT variations from the normal: skull, scalp, nodes, salivary glands, external auditory canal, ear drums, hearing, gums, oral mucosa, posterior pharynx, and nasal mucosa.

24. Identify and describe eye variations from the normal: extraocular movement, conjugate gaze, vision, pupils (ERLA) conjuctiva, lens, and fundus.

25. Identify and describe variations from the normal in these musculo-skeletal areas: gait, ability to stand and sit, small joints of the hands, range of motion of joints, strength and mass of major muscles.

26. Identify and describe variations from the normal in the central nervous system: cranial nerves, speech, ability to identify objects, memory, coordination of muscle movements, balance, position sense, sense of touch, sense of pain, major motor nerve, peripheral reflex, plantar reflex.

27. Identify and describe variations from the normal in mental status: appearance, orientation, mood/affect, thinking, memory, judgment and insight.

PROBLEM IDENTIFICATION

28. Identify all major problems suggested by the data and state them at a level of precision that can be justified by the data and by the level of experience of the student.

29. Demonstrate concern for all potential problem areas: biologic-physical, emotional-psychiatric, social-family-economic.

ORAL PRESENTATION

30. Give a concise, organized presentation of the data in a manner which listeners can understand.

ATTITUDES

31. Take a critical approach to problems and data, avoiding "logic leaps" in problem solving.

32. Demonstrate motivation to learn.

33. Contribute actively in group sessions.

34. Apply the biological sciences to clinical problem-solving and management, thinking in terms of pathophysiology.

35. Discuss applications of social and behavioral sciences to the patient-physician relationships, and the physician's role in society.

36. Participate in on-going close relationships with the faculty.

37. Accept responsibility for attendance in activities and completing assigned tasks.

38. Demonstrate initiative in getting additional information on unresolved problems.

39. Display sensitivity to the feelings of patients and colleagues. Avoid acts which cause physical and emotional discomfort.

40. Maintain appropriate confidentiality of information.

41. Present an appearance acceptable to the expectations of patients and the profession.

University of Connecticut Health Center
Committee on the Curriculum

Subject Committee Chairman: F. Davidoff
Curriculum Committee Chairman: C. Gjerde

INTRODUCTION TO
CLINICAL MEDICINE II

EDUCATIONAL GOALS AND OBJECTIVES

GOALS

* Perform several complete history and physical examinations and many examinations of systems covered in the basic science committees.

* Experience extended contacts with patients.

* Relate history and physical findings to basic science subject committees.

* Discuss pathophysiology and the "tricks of the trade" with preceptors and students.

OBJECTIVES

COMMUNICATION SKILLS

1. Be at ease with patient.
2. Put the patient at ease.
3. Allow the patient to express himself.
4. Be flexible, yet organized in approach.
5. Pursue clues logically.
6. Pursue clues thoroughly.
7. Be non-judgmental of the patient
8. Redirect the interview effectively when the patient rambles.
9. Avoid excessive leading questions.

PERFORMANCE OF THE PHYSICAL EXAM

10. Show appropriate concern for patient's comfort.
11. Take appropriate sanitary precautions (e.g., wash hands).
12. Be reasonable systematic in examining the organ system.
13. Be relatively relaxed through all of the exam.

February 5, 1975

14. Focus with appropriate care on areas where history indicates pathology.

15. Make an effort to validate equivocal findings, (e.g., resposition or exercise the patient to bring out a faint murmur, ask a second observer to confirm marginally enlarged liver).

16. Position the patient correctly.

17. Use correctly the following instruments: stethoscope, blood pressure cuff, opthalmoscope, nasal speculum, flashlight, tuning fork, tongue depressor, measuring tape, otoscope.

FINDINGS ON HISTORY AND PHYSICAL EXAMINATION

18. Write a concise patient profile which provides a reasonable complete picture of the patient's life situation as relevant to his/her medical problems (including e.g., education, employment, and finances).

19. Identify the "chief complaint" of the present illness and its duration in the patient's own terms, using quotations wherever possible.

20. Amplify the chief complaint: recording subjective and objective aspects of the problem; describing chronologically the nature, and severity of the symptoms; describing the disabilities present, sources of relief, prior care, pertinent negative.

21. Collect appropriate past medical history data from the following categories: (a) Pediatric - developmental history, pregnancy, prenatal events, birth weight, nutritional history, immunizations, developmental milestones, emotional adjustment, school placement and progress; and (b) General - hospitalizations, operations, injuries, allergies, weight (maximum, minimum and changes), drug use (including alcohol, coffee, tobacco), past and current medications, occupational exposures.

22. Construct a family medical history which includes diseases with known genetic transmission and infectious diseases in family contacts.

Note: Standards for evaluation of the history will include: clarity, conciseness, correctness of grammar and spelling, organization, emphasis, correct use of technical language, and avoidance of over-interpretation of data.

PHYSICAL EXAMINATION

23. Accurately record the following vital signs: blood pressure, pulse, respirations, height and weight.

24. Make an accurate and complete description of the patient's general appearance and condition.

25. Identify and describe HENT variations from normal in the following areas (or if normal, record your findings): skull, scalp, salivary glands, external auditory canal, ear drum, hearing, tongue, gum, oral mucosa, posterior pharynx, nasal mucosa, and teeth.

26. Identify and describe eye variations from the normal in the following areas (or if normal, record your findings): extra-ocular movement, conjugate gaze, visual acuity, confrontation fields, pupils (E,R,L,A), conjunctivae, lens, fundi, if opportunity presents itself.

27. Identify and describe cardiovascular variations from the normal in the following areas (or if normal, record your findings): neck veins, peripheral pulses, leg veins, pulse quality and rhythm, cardiac exam (inspection; palpation; percussion; auscultation, heart sounds described, murmurs detected, adventitious sounds noted), and evidence of edema.

28. Identify and describe respiratory variations from the normal in the following areas (or if normal, record your findings): a. respiratory effort, (grunting, retraction, wheeze, accessory muscles); b. cough or sputum; c. larynx and trachea; d. chest examination (inspection, configuration), palpation (fremitus, chest movement), percussion (diaphragm movement), and auscultation; e. associated systemic signs (cyanosis and clubbing).

29. Identify and describe gastrointestinal variations form the normal in the following areas (or if normal, record your findings): a. abdomen inspection (distention, scars, striae), palpation (resistance, tenderness), percussion (resonance, fluid), and auscultation (bowel sounds); b. viscera - liver, masses; c. rectal - hemorrhoids, fissures, and prostate, stool guaiac; d. associated systemic signs - jaundice, pallor, and tongue papilation.

30. Identify and describe genito-urinary variations form the normal in these areas (or if normal, record your findings): a. kidneys - palpation and CVA tenderness; b. bladder - palpation, and suprapubic tenderness; c. genitalia - male (penis, testes, prostate, hernias) or female (vulva, vagina, cervix, uterus): d. associated systemic signs - excoriations, twitching, and neuropathy.

31. Identify and describe hematologic variations from the normal in the following areas (or if normal, record your findings): a. lymph nodes - cervical, supraclavicular, axillary, epitrochlear, inguinal; b. spleen; c. skin - ecchymoses, purpura, petechiae, and pallor; d. mucosa - bleeding, pallor, ulceration, and tongue papillation; e. associated systemic signs - peripheral neuropathy, and liver.

32. Identify and describe endocrine variations from the normal in the following areas (or if normal, record your findings): a. thyroid; b. adipose mass - skinfold thickness, and distribution; c. hair distribution - scalp, peripheral, axillary, and pubic; d. skin - pigmentation, dryness, a and thinning; e. bones - deformity, and stature; f. associated systemic signs - exophthalmos, band keratopathy, diabetic neuropathy, and retinopathy.

33. Identify and describe musculo-skeletal variations from the normal in the following areas (or if normal, record your findings): gait; ability to stand and sit; small joints of hands; range of motion of wrists, elbows,

shoulders, neck, hips, knees, ankles; back; and strength and mass of biceps, triceps, gastrocnemius, quadriceps.

34. Identify and describe central nervous system variations from the normal in the following areas (or if normal, record your findings): speech, agility to identify objects, memory, cranial nerves, coordination, balance, position sense, sense of touch, sense of pain, major motor nerves, deep tendon reflexes, plantar reflexes.

35. Identify and describe mental status variations from the normal in the following areas (or if normal, record your findings): appearance, orientation, mood/affect, thinking, memory, and judgment and insight.

Note: Standards for evaluation of the physical exam are no major deficits in the student's ability to perform the examination, to identify variations from normal, and to record normal and abnormal findings clearly and concisely.

PROBLEM IDENTIFICATION

36. Identify all problems suggested by the data (including biological-physical, emotional-psychiatric, social-family-economic), and state them at a level of precision justified by the data.

SKILLS OF ORAL PRESENTATION

37. Give a presentation that is well organized, concise and complete, with proper emphasis on major problems.

38. Make a presentation in clear language so that it is easily understood and so that listeners can ask appropriate questions.

ATTITUDES

39. Take a probing attitude to problems and data.

40. Show motivation to learn.

41. Participate actively in preceptor discussion sessions.

University of Connecticut Health Center
Committee on the Curriculum

Subject Committee Chairman: M. Lepow
Curriculum Committee Chairman: C. Gjerde

INTRODUCTORY CLERKSHIP

EDUCATIONAL GOALS AND OBJECTIVES

GOALS

* For adults and children with physical and psychiatric problems, collect the primary data base, identify the problems, and outline the next steps toward a solution of the problem (laboratory tests and problem management).

* Become familiar with the team that provides health care.

* Be familiar with hospital records, data sources, and laboratory tests.

* Understand the work settings in a hospital.

* In case managment, demonstrate a concern for some of the broader issues of medical care such as (a) preventability of disease, (b) continuity of care, (c) cost of care, and (d) health professional teamwork.

* Experience a variety of common medical problems (e.g., heart, stroke, cancer, cardiovascular, gastrointestinal, neurological, asthma).

* Approach medical illnesses as problem-solving exercises and as stimuli for further study and life long self-education.

* Apply fundamental biological and psychosocial knowledge to the interpretation of clinical disease.

OBJECTIVES

GENERAL ATTITUDES AND SKILLS

1. Show a sense of responsibility for patients and a concern for their welfare.

2. Show motivation to follow up patients and their problems.

3. Accept responsibility for attendance in activities and completing assigned tasks.

4. Demonstrate initiative in getting addititional information on unresolved problems.

5. Display sensitivity to the feelings of patients and colleagues; avoid acts which cause emotional and physical discomfort.

February 5, 1975

IC

6. Present an appearance acceptable to the expectations of patients and the profession.

7. Be at ease with the patient and the parents or relatives giving the history.

8. Be adaptable when age or language barriers create problems.

9. Put the patient as ease and recognize when the patient is fatigued.

10. Be flexible, yet organized in approach.

11. Pursue clues logically.

12. Pursue clues thoroughly.

13. Pronounce, spell and use correctly the common medical terminology.

14. Translate medical terminology into the patient's language in the history, patient management, and physical exam.

15. Give a disciplined recording and presentation of your case.

INTERVIEW/HISTORY

16. Gather historical data from the patient, parent, or family of the patient.

17. Write a concise patient profile which provides a reasonable complete picture of the patient's life situation as relevant to his/her medical problems (including e.g., education, employment, and finances).

18. Identify the "chief complaint" of the present illness and its duration in the patient's own terms, using quotations wherever possible.

19. Amplify the chief complaint: recording subjective and objective aspects of the problem; describing chronologically the nature, and severity of the symptoms; describing the disabilities present, sources of relief, prior care, pertinent negatives.

20. Collect appropriate past medical history data form the following categories: Pediatric - developmental history, pregnancy, prenatal events, birth weight, nutritional history, immunizations, developmental milestones, emotional adjustment, school placement and progress; and General - hospitalizations, operation, injuries, allergies, weight (maximum, minimum, and changes), drug use (including alcohol, coffee, tobacco), past and current medications; occupational exposures, immunizations, significant illnesses, contagious disease history.

21. Construct a family medical history which includes diseases with known genetic transmission and infectious diseases in family contacts.

22. Conduct a Review of Systems.

IC

PHYSICAL EXAM

23. Be systematic in examining the organ system.

24. Be relaxed through all the exam.

25. Make an effort to validate equivocal findings.

26. Use correctly the following instruments: stethoscope, sphigomomanometer, ophthalmoscope, nasal speculum, flashlight, tuning fork, tongue depressor, measuring tape, otoscope.

27. Accurately record the following vital signs: blood pressure, pulse, respirations, height and weight (head circumference in infants).

28. Make an accurate and complete description of the patient's general appearance and condition. Assess the developmental level of a child.

29. Identify and describe HENT variations from normal in the following areas (or if normal, record your findings): skull, scalp, salivary glands, external auditory canal, ear drum, hearing, tongue, gum, oral mucosa, posterior pharynx, nasal mucosa, and teeth.

30. Identify and describe eye variations from normal in the following areas (or if normal, record your findings): extra-ocular movement, conjugate gaze, visual acuity, confrontation fields, pupils (E.R.L.A.), conjunctivae, lens fundi (if no abnormality, identify disc).

31. Identify and describe cardiovascular variations from the normal in the following areas (or if normal, record your findings): neck veins, peripheral pulses, leg veins, pulse quality and rhythm, cardiac exam (inspection,palpation, percussion, auscultation, heart sounds described, murmurs detected, adventitious sounds noted), and evidence of edema.

32. Identify and describe respiratory variations from the normal in the following areas (or if normal, record your findings): a. respiratory effort, (grunting, retraction, wheeze, accessory muscles), b. cough or sputum, c. larynx and trachea, d. chest examination (inspection, configuration), palpation (fremitus, chest movement), percussion (diaphragm movement), and auscultation, e. associated systemic signs (cyanosis and clubbing).

33. Identify and describe gastrointestinal variations from the normal in the following areas (or if normal, record your findings): a. abdomen inspection (distention, scars, striae), palpation (resistance, tenderness), percussion (resonance, fluid), and auscultation (bowel sounds) b. viscera - liver, masses, c. rectal - hemorrhoids, fissures, and prostate; stool guaiac, d. associate systemic signs - jaundice, pallor, and tongue papilation.

34. Identify and describe genito-urinary variations from the normal in these areas (or if normal, record your findings): a. kidneys - palpation and CVA

tenderness, b. bladder - palpation, and suprapubic tenderness; c. genitalia - male (penis, testes, prostate, hernias) or female (vulva, vagina, cervix, uterus), d. associated systemic signs - excoriations.

35. Identify and describe hematologic variations from the normal in the following areas (or if normal, record your findings): a. lymph nodes - cervical, supraclavicular, axillary, epitrochlear, inguinal; b. spleen; c. skin - ecchymoses, purpura, petechiae, and pallor; d. mucosa - bleeding, pallor, ulceration, and tongue papillation; e. associated systemic signs - peripheral neuropathy, and liver.

36. Identify and describe endocrine variations from the normal in the following areas (or if normal, record your findings): a. thyroid, b. adipose mass - skinfold thickness, and distribution c. hair distribution - scalp peripheral, axillary, and pubic; d. skin - pigmentation, dryness, and thinning; e. bones - deformity, and stature; f. associated systemic signs - exophthalmos, band keratopathy, diabetic neuropathy, and retinopathy.

37. Identify and describe musculo-skeletal variations from the normal in the following areas (or if normal, record your findings): gait; pain; ability to stand and sit; small joints of hands; range or motion of wrists, elbows, shoulders, neck; hips, knees, ankles; back; and strength and mass of biceps, triceps, gastrocnemius, quadriceps.

38. Identify and describe central nervous system variations from the normal in the following areas (or if normal, record your findings): speech, ability to identify objects, memory, cranial nerves, coordination, balance, position sense, sense of touch sense of pain, major motor nerves, deep tendon reflexes, plantar reflexes, gait.

39. Identify and describe mental status variations from the normal in the following areas (or if normal, record your findings): appearance, orientation, mood/affect, thinking, memory, and judgment and insight.

Note: Standards for evaluation of the physical exam are that there be no major deficits in the student's ability to: perform the examination, identify variations from normal, record normal and abnormal clearly and concisely, and record all negatives in the written record. (There should be some degree of facility with these procedures).

PROBLEM IDENTIFICATION

40. Identify all problems suggested by the data (including biological-physical, emotional-psychiatric, social-family-economic), and state them at a level of precision justified by the data.

41. Integrate the data into a problem list.

42. Use further lab tests to confirm or rule out tentative diagnoses.

IC

PATIENT MANAGEMENT

43. Develop a logical management plan, identifying the initial treatment and areas in which you need more information.

44. Develop a diagnostic plan

45. Follow the progress of the patient where possible.

University of Connecticut Health Center
Committee on the Curriculum

Subject Committee Chairman: D. Almond
Curriculum Committee Chairman: C. Gjerde

MEDICINE CLERKSHIP

EDUCATIONAL GOALS AND OBJECTIVES

GOALS

* Understand the principles, practice, and scope of the specialty of Internal Medicine.

* Understand the correct approach to and the medical management of a sick adult.

OBJECTIVES

1. Independently define the critical questions about the patient's episode of illness; suggest means by which the questions could be answered; try to obtain the information to answer the critical questions.

2. Elicit histories that are complete to the point where a more experienced physician connot consistently obtain relevant additional data from the patient at roughly the same point of time.

3. Obtain additional information about a patient from other sources when it is necessary to do so.

4. Perform physical examinations that are generally complete and accurate within a reasonable period of time.

5. Perform certain laboratory tests (e.g., examination of a peripheral blood smear, determination of the hematocrit, and a complete urinalysis) routinely on all patients worked up by students, and other tests (e.g., gram stain of body fluids) on selected patients when indicated.

6. Prepare a complete, accurate, and appropriate problem list expressed in words that reflect the degree of definition of the problem.

7. Interpret or assess each item in the problem list, and provide an appropriate differential diagnosis and formulation wherever they are indicated.

8. Develop a plan of management that contains appropriate diagnostic, therapeutic, and patient education elements; carry out this plan responsibly when it has been approved; explain the mechanism of action of the drugs used.

9. Justify your diagnostic and therapeutic plan by assessing the benefits and risks of each element of the plan.

January 14, 1975

MC

10. Communicate tactfully with the patient using language that he is most likely to understand, and demonstrate a degree of sensitivity toward the concerns of the patient and his family.

11. Tactfully explain to the patient and/or his family the nature of the illness, its evaluation, treatment, prognosis, and any alterations in life style which it necessitates.

12. Follow the patient closely throughout his hospitalization in order to understand, insofar as it is possible, what is going on with that patient at any point in time; revise formulations whenever new evidence warrents doing this.

13. Write appropriate problem-oriented progress notes in the chart.

14. Interpret all available diagnostic information about a patient, e.g., x-rays, biopsy material, lab tests, procedure results such as sigmoidoscopy findings.

15. Write appropriate orders using the correct format.

16. Perform certain procedures, e.g., venipuncture, arterial puncture, thoracocentesis, lumbar puncture, EKG.

17. Write a discharge summary.

18. Interact appropriately with peers and other members of the health care team.

University of Connecticut Health Center
Committee on the Curriculum

Subject Committee Chairman: G. Rodan
Curriculum Committee Chairman: C. Gjerde

MUSCULOSKELETAL

EDUCATIONAL GOALS AND OBJECTIVES

GOALS

* Interact with a human body in a person-to-object relationship.

* Relate muscular action to limb movement (e.g., walking, running, pitching, playing a violin) by recognizing the muscles and nerves involved in the different phases of each movement.

* Be familiar with the clinically relevant basic knowledge of bone, joints, muscle, and skin.

* Review the concepts in physiology (homeostasis, ion regulation, tissue remodeling), and pathology (inflammation, immune diseases, and diseases of the skin) which apply to bone, joints, muscle, and skin.

* Synthesize the general concepts and detailed knowledge (of cyto-differentiation, tissue turnover, and calcium homeostasis) to that you can predict changes in the tissue which will result from a given set of conditions.

OBJECTIVES

DISSECTION/ANATOMY

1. Define and use in the proper context a number of technical terms which describe anatomical relationships (median, lateral, sagettal) and body movements (flexion, extension, adduction, abduction).

2. Identify by name and locate on a skeleton or on a radiograph the bones of the extremities.

3. Identify the structures encountered in the dissection of the extremeties (skin, muscle, blood vessels, nerves, tendons).

4. Identify during the dissection each of the respective structures listed in the dissection guide (in the syllabus).

5. Associate each muscle with its respective blood vessels.

6. Identify on a cadaver the innervation of major muscles as listed in the dissection guide.

7. From the muscle attachments to the bones, deduce the movement around the joints which would result from the contraction of those particular muscles.

19 August 1974

MS

8. Identify the changes in the locomotive system of humans which can be related to bipedalism and their impact on the evolutionary process.

BIOLOGY OF CALCIFIED TISSUE

9. Describe the sequence of cellular and tissue changes in bone occuring during embryonic development, during bone remodelling, and during fracture healing.

10. Discuss the physical-chemical constraints and the regulatory factors involved in the deposition of mineral in calcified tissue.

11. Formulate the general scheme of calcium turnover in the human body and the regulatory effects of hormones and vitamins on the organs involved (bone, kidney, gut).

12. Predict the changes which would occur in the bone tissue upon stresses of calcium homeostasis; describe the associated events in the kidney and gut.

13. Define the mechanical properties of bone and the conditions under which it is amenable to fracture; relate the anatomy of the fractures to the mode of trauma and the anatomy of the bone.

14. Recognize the effect of mechanical stimuli on bone remodelling; discuss the effects of bed rest, weightlessness, etc., on the skeleton and on calcium homeostasis.

15. Discuss the major diseases of the skeleton — osteoporosis, osteomalacia, osteomyelitis, bone tumors, rickets, hyperparathyroidism — in terms of their etiology and pathophysiology, and recognize their histopathological pictures.

JOINTS

16. Define rheumetoid factor, antinuclear antibody.

17. Describe the mechanism for inflammation in the joint.

18. Describe the mechanism of tissue injury (joint, blood vessel, kidney) in systemic lupus erythematosus.

19. Explain the mechanism of joint tissue injury in gout.

20. Compare and contrast gout with pseudogout in regard to etiology and laboratory findings.

21. Describe the possible origins of hyperuricemia.

22. State the common causes of septic arthritis; describe the synovial fluid in septic arthritis; formulate the treatment of a patient with septic arthritis.

23. Discuss the unique genetics of ankylosing spondylitis.

24. Describe the pathological changes in the skin of a patient with Scleroderma.

MUSCLE PATHOLOGY

25. Describe main features of the following pathological changes occuring in muscle; degenerative, atrophic and dystropic, inflammatory, and neoplastic; and identify the histological characteristics of each.

26. Describe the inheritance pattern and the clinical features of Duchenne muscular dystrophy and discuss the associated biochemical changes.

SKIN

27. Identify on a histological slide, the layers of the skin -- epidermis, dermis, and the appendages (sweat glands, sebaceous glands, hair, and nails) and their respective constituents.

28. Relate each of the skin's anatomic constituents and their physical and/or physiological properties to the functions of the skin.

29. Name the biochemical substances and the enzymes involved in melanin formation.

30. Discuss the causes of skin cancer and their epidemiology.

31. Recognize upon examination of slides, the features characteristic of premalignant, and malignant lesions of the skin.

HERITABLE DISORDERS OF CONNECTIVE TISSUE

32. Discuss the involvement of skin and bone in the following heritable disorders of connective tissue: (Marfan's syndrome, osteogenesis imperfecta, homocystinuria, Ehlers-Danlos syndrome, cutis laxa, pseudoxanthoma elasticum, Hurler syndrome, Mucopolysaccaridoses), and identify the biochemical lesion where known.

University of Connecticut Health Center
Committee on the Curriculum

Subject Committee Chairmen: J. Blechner, F. Sassano — OBSTETRICS-GYNECOLOGY
Curriculum Committee Chairman: C. Gjerde — CLERKSHIP

EDUCATIONAL GOALS AND OBJECTIVES

GOALS

* Understand the problems of obstetrics, medical and operative gynecology, and intrauterine development.

OBJECTIVES

1. Describe the physiologic changes in the maternal organism caused by the stress of pregnancy.

2. Describe fetal nutrition and metabolism, their limitations on fetal growth, and the causes of perinatal morbidity and mortality.

3. Describe common methods of diagnosis and prevention of fetal difficulties prior to birth.

4. Recognize normal labor, abnormal variants, and discuss their treatments.

5. Identify common obstetric diseases, particularly those related to infection, hemorrhage and toxemia.

6. Perform a normal vaginal delivery.

7. Explain the role of the female sex hormones in obstetric and gynecologic disease, including infertility.

8. Discuss benign gynecologic diseases, and the biology of cancer in cervical and endometrial carcinoma.

9. Detect and prevent female cancer.

10. Discuss the surgical, radiotherapeutic and chemotherapeutic approaches to the control and cure of gynecologic cancer.

11. Discuss the current problems of population expansion and the methods available for its control.

12. Interview and examine women with obstetric and gynecologic conditions and complaints.

13. Identify the patient's major obstetric or gynecologic problems and formulate the approach for diagnosis, treatment and follow-up.

27 January 1975

14. Produce a written record, in reasonably concise form oriented to the patient's significant problems.

15. Organize concise oral presentations of cases for rounds, conferences, etc.

16. Follow the progress of patients and state their current status.

17. Respond (in accordance with his level of training) to emergency situations on Obstetrics and Gynecology.

18. Perform a pelvic examination completely and systematically.

19. Obtain a Papanicalaou smear properly.

20. Examine the pregnant uterus correctly.

21. Resuscitate and examine newborn infants.

22. Diagnose and treat common office problems of the female patient.

23. Enumerate the important diagnostic pitfalls in obstetrics and gynecology that are commonly troublesome to the non-specialty practitioner.

24. Diagnose pregnancy.

25. Recognize antepartal complications requiring hospitalization.

26. Describe the forces concerned in labor, the normal mechanisms of labor, the clinical course of labor, and the methods used to relieve the pain of labor.

27. Describe the stages of abortion.

28. Describe the indications for cesarean section.

29. Describe the indications for and contraindications to the use of oxytocics, and observe their effects on labor.

30. Select gynecologic treatment appropriate for the age, past reproductive history, and the reproductive capacity and desires of the patient and her husband.

31. Discuss the pathophysiology of common gynecologic diseases.

32. Identify the gross pathology commonly seen in the gynecologic operating room.

33. Outline the essentials of preoperative workup and preparation and of postoperative care in gynecology.

University of Connecticut Health Center
Committee on the Curriculum

Subject Committee Chairmen: I. Goldschneider, R. Tilton
Curriculum Committee Chairman: C. Gjerde PATHOBIOLOGY

EDUCATIONAL GOALS AND OBJECTIVES

GOALS

MICROBIOLOGY AND INFECTIOUS DISEASE

* Appreciate the problem solving approach used in biomedical research as it relates to the nature of host-parasite interraction.

* Assess the multiple roles of micro-organism and host in the disease state.

* Recognize the bacterium, fungus, and virus as unique biological entities.

OBJECTIVES

1. Recognize the major anatomic differences between procaryotic and eucaryotic cells.

2. Identify the major anatomic parts of a bacterium and describe their functions.

3. Given the name of a micro-organism, determine whether it is a virus, a bacterium or a fungus; state its Gram-stain reaction, if any, describe its shape and its atmospheric requirements; and describe a major biological characteristic of the organism (e.g., the toxin of the diptheria bacillus, the extra-cellular enzymes of the group A streptococci).

4. Describe the site of action of antibiotics such as penicillin and vancomycin in the process of cell wall synthesis of a bacterium. Recognize the unique role of "carrier lipid."

5. Assess the biological factors in the host-parasite relationship which contribute to the likelihood that an organism is virulent.

6. Describe the structure of bacterial LPS and explain the functions of its various elements (e.g., lipid A, O-antigenic side chain).

7. Compare the following patterns of bacterial metabolism: autotrophs vs. heterotrophs, fermentation vs. respiration, obligate anaerobiosis vs. facultative anaerobiosis vs. obligate aerobiosis.

8. Assess the virus as a biological entity by describing (a) its molecular structure, (b) its classification (RNA, DNA viruses), etc., (c) its growth cycle.

9. Discuss the virus as an agent of human cancer.

September 12, 1974

PB

10. Evaluate viral pathogenesis as a function of (a) portal of entry, (b) patterns of infection, (c) systemic manifestations, (d) diagnostic aspects, and (e) epidemiology of viral infection.

11. Given a model of an infectious disease state, define and discuss (a) epidemiology, (b) host factors which resist infection, (c) routes of spread within the host, and (d) the general principles of treatment of infection.

12. Evaluate the particular problems of infection in the hospitalized patient and the altered host.

13. Discuss the pathologic consequences of infectious disease as a function of both the infectious agent and the host reaction to this agent.

14. Describe a representative member of each major drug group. Discuss the basic chemical structure, bacteriological spectrum, and pharmacological and medical properties based on the prototypes given.

15. Discuss the concept of interferon-mediated viral interference with regard to the following points: interferon induction and synthesis; mechanism of interferon action. Compare intrinsic viral interference with interference mediated by interferon action.

16. Given a set of unknown bacteria, use the scientific problem-solving approach to identify these unknowns. Elements of the approach should include: isolation of the unknown agent, performance of testing procedure, collection of data, analysis of data, reference to appropriate literature, identification of the unknown and, justification of the rationale for your decision.

Note: In pursuing the unknown bacterium, certain motor skills will be learned such as streaking of an agar plate, Gram-staining a specimen, and using certain apparatus to identify the bacterium. Although these skills may subsequently become important to the student, the committee does not consider their mastery is a primary objective of the course.

GOALS

PATHOLOGY

* Describe the basic pathological processes.

* Understand the metabolic, structural and functional changes which occur in cells in response to injury.

* Understand the pathophysiology of fluid and hemodynamic derangements.

* Appreciate the spectrum of disorders of growth and differentiation at the cellular level.

* Understand the mechanisms of inflammation and their roles in physiological and pathological processes.

* Use the above concepts to interpret the pathological changes illustrated by sections of tissues obtained at surgery or at autopsy.

PB

OBJECTIVES

17. Describe the subcellular changes (structural and chemical) that are associated with specific types of cell injury.

18. Explain the concepts of reversibility and irreversibility in cell injury.

19. Describe the events which follow cell death (autolysis).

20. Discuss the various categories of cellular degeneration and give examples of each.

21. Describe the organization of the circulatory system.

22. Discuss the mechanisms of occurrence of edema fluids, active hyperemia, passive hyperemia, thrombosis, hemorrhage, embolization. Discuss the pathological consequences of each.

23. Define infarction, and discuss the pathophysiological factors which determine whether infarction will occur in these organs: heart, brain, lung, kidney, intestinal tract, extrementies.

24. Characterize the following: atrophy, hypertrophy, hyperplasia, metaplasia, dysplasia, neoplasia, anaplasia.

25. Distinguish a benign from a malignant neoplastic process.

26. Define the two major classes of neoplasms and give examples of each.

27. Describe the characteristics of malignant tumors that are life threatening.

28. Discuss the major therapeutic approaches to cancer (surgery, radiation, chemotherapy, immunotherapy).

29. Discuss the known etiologies of cancer in animals and human beings; give specific examples.

30. Discuss the major theories of carcinogenesis (chemical, radiation, viral, genetic).

31. Describe the life cycle of a malignant tumor, using carcinoma of the uterine cervix or leukemia as examples.

32. Define inflammation.

33. List the cellular and humoral components of the inflammatory response and describe their respective roles in initiating the sequence of events from the time of injury to the time of resolution of the injury.

34. Describe the physiological functions and the pathological complications of the inflammatory response.

35. Distinguish the major categories of inflammation in terms of their histological patterns.

PB

36. Describe and contrast the processes of regeneration and repair which follow tissue injury.

37. Describe the types of exudates frequently associated with inflammatory processes.

IMMUNOLOGY

38. Define antigen, antibody, hapten, immunoglobulin.

39. Explain the basis of immunologic specificity in terms of complementarity of antibodies and antigen determinants; describe how Landsteiner used haptens of well-defined chemical structure to arrive at out present concept on immunologic specificity.

40. Describe the basic four-chain structure of antibody, the relation of that structure to the different functions of antibody (i.e., ability to combine with antigen, to fix complement, cytophilic activity, ability to act as opsonins, and cytotropic activity, and describe the relationship of this basic structure to the various immunoglobin classes and the various functions among those classes.

41. Describe in vitro antigen-antibody reactions such as: the precepitin reaction, agglutination reaction, opsoninization and cite some uses of these reactions.

42. Describe serum complement, its multicomponent nature, the general principles of its sequential activation and reaction, and the biologic function of complement and the in vitro complement fixation reaction.

43. List the various biochemical kinds of antigens (protein, carbohydrates, nucleic acids).

44. Describe the origins, cytological characteristics, anatomical distribution, and physiological and pathological functions of the cells which comprise the reticuloendothelial system.

45. Outline the developmental pathways and life histories of thymus-derived (T-cells) and non-thymus-derived (B-cells) lymphocytes in birds and mammals.

46. Describe the functional anatomy of the thymus, lymph nodes, spleen, tonsils, adenoids and gut associated lymphoid tissues.

47. Describe the cytological and histological changes that occur in lymphoid tissues after antigenic stimulation.

48. Describe the characteristics of primary and secondary (booster, anamnestic) antibody responses.

49. Discuss the mechanisms by which antigens and antibodies control the quality and quantity of the antibody response.

PB

50. Outline the cellular organization and possible functions of the secretory antibody system.

51. Discuss the immunological significance of the passage of antibodies from mother to fetus via the placenta.

52. Describe the characteristics of thymus-dependent and thymus-independent antigens.

53. Discuss the possible roles of cell surfaces receptors for antigens, antibodies, complement components, and lectins on the functions of T-cells, B-cells and macrophages.

54. Define, explain and give examples of the following terms and concepts commonly used in immunological parlance: (a) lymphocyte heterogeneity, (b) generation of immunological diversity, (c) activation of lymphocytes, (d) activation of macrophages, (e) immunological competence, (f) clonal selection theory, (g) cell-mediated immunological reactions, (h) antibody-mediated immunological reactions, (i) helper, suppressor, killer, mediator, memory lymphocytes, (j) antigen-recognition cells, (k) antibody-producing cells; (l) immune elimination of antigen, (m) carrier specificity; hapten specificity, (n) immunological surveillance, (o) recirculation of lymphocytes, (p) immunological memory (anamnesis), (q) maturation of the antibody response, (r) cell-cooperation in immunological reactions, (s) physiological hypogammaglobulinemia, (t) blast transformation of lymphocytes, (u) lymphocyte-specific cell surface antigens, (v) immunolfluorescense (direct and indirect), (w) hemolytic plaque technique, (x) central lymphoid tissues; peripheral lymphoid tissues, (y) long-lived lymphocyte; short-lived lymphocyte, (z) large lymphocyte; small lymphocyte.

55. Describe the mechanisms involved in anaphylasix, immunologic complex disease (the arthus reaction, and acute experimental serum sickness), in regard to the specific and non-specific factors which are involved, (e.g., the nature of the antibodies, the mediators, the effect or enzyme systems) and how these factors operate to produce the given allergic reaction.

56. Explain the resemblance of experimental models of immediate type hypersensitivity in animals to human disease.

57. Describe the mechanisms by which the immune systems recognize the presence of alien transplantation antigens and how the immune system destroys these antigens.

58. Describe what steps and by what means the immune systems can be suppressed.

60. Explain the need for self-tolerance; how is it developed; how is it circumvented and the result of its loss.

61. Classify the major congenital and acquired immunological deficiency disorders.

62. Discuss the possible roles that the immunological system may play in destroying or enhancing the survival of neoplasms.

University of Connecticut Health Center
Committee on the Curriculum

Subject Committee Chairman: R. Gold
Curriculum Committee Chairman: C. Gjerde

PEDIATRICS CLERKSHIP

EDUCATIONAL GOALS AND OBJECTIVES

GOALS

* Understand the physical and psychosocial growth and development of children.

* Recognize the influences of the family and society on growth and development.

* Apply your knowledge of normal growth and development to the prevention and management of illness.

* Understand the institutions and personnel utilized to deliver health care to children.

* Participate in the care of the critically ill child and his family; participate in the moral, religious, and ethical discussions about a child with a terminal or life-threatening illness.

* Communicate with and deliver care to patients of all racial and economic backgrounds.

OBJECTIVES

1. Obtain a comprehensive history (as outlined in the Complete Data Base) of a well or sick child from a parent, parent surrogate, or when appropriate, from the child himself.

2. Perform physical examinations appropriate for child's age as indicated in Complete Data Base.

3. In your physical exam demonstrate concern for the child's developmental stage and sexual modesty; establish rapport with the child so that the trauma of the physical exam is minimized.

4. Describe the age-related principles for screening and perform lab screening tests listed in Complete Data Base.

5. Integrate your history and physical and formulate a complete problem list, utilizing the Problem Oriented Record to include all types of pediatric problems.

6. Formulate plans for all problems identified, including: further diagnostic work needed to define problems; therapy; follow-up; and parental education. In formulating your plans, consider the setting required to carry out the care, the need for specialist care, and the perceptions and concerns of the parents as to what is wrong.

2nd January 1975

7. Arrange for lab tests and x-rays.

8. Recognize that the developmental stage of a child influences the plan; demonstrate through the plan (e.g., time for return visits) that you have considered the child's growth and development.

9. Write appropriate orders and prescriptions.

10. Interpret all common laboratory tests.

11. Recognize normal physical growth and deviations from the normal.

12. Assess normal development by utilizing the Denver Development Screening Test.

13. Assess behavior and neurologic status, including the motor, special sensory, and coordination as outlined in the syllabus.

14. Give parents anticipatory guidance and preventive health advice on feeding, immunizations, accident and poisoning prevention, acute minor illnesses.

15. Diagnose and manage some of the following acute illnesses: respiratory tract infections, streptococcal disease, otitis media, pneumonia, gastroenteritis, common contagious diseases (measles, mumps, chickenpox, rubella) and some of the following chronic disorders: urinary tract infections, asthma, eczema, rheumatic fever, sickle cell disease, iron deficiency anemia, tuberculosis, venereal disease, parasitic infections. In each case, describe the etiology, epidemiology, and pathology.

16. Initiate the evaluation of developmental and behavioral disorders such as eneuresis, recurrent abdominal pain, obesity, tantrums, aggressiveness, retardation, slow speech, school failure, hyperactivity.

17. Perform the following procedures, showing concern for the hazards of the procedures and the reactions of children to the procedures: a. immunizations; b. IM and SC injections; c. Venipunctures; d. Cultures of nose, throat, blood and urine; e. Throat cultures; f. Vision screening.

18. Discuss indications, costs, and risks of any test or procedure ordered on a child.

19. Use community services for patients (e.g., discuss available resources with social workers and make appropriate referrals).

20. Work with other members of the health team such as community health aides, social workers, PNA's, child life workers.

21. Identify local and national health services which affect the care of children.

22. Make a brief oral presentation and an organized written presentation of your case.

23. Demonstrate appropriate follow-up of the patient.

24. Demonstrate an attitude of cooperation and sharing of care of the patient with other members of the health care team.

University of Connecticut Health Center
Committee on the Curriculum

Subject Committee Chairman: R. Volle
Curriculum Committee Chairman: C. Gjerde

PHARMACOLOGY

EDUCATIONAL GOALS AND OBJECTIVES

GOALS

* Understand the mechanisms of action of prototypical drugs.

* Recognize that drugs have actions on all systems and that drug classifications are for convenience and not absolute.

* Recognize that the response of an individual to a drug may depend on many variables such as the absence or presence of a disease or the presence or absence of another drug.

* Recognize that all drugs are poisons.

OBJECTIVES

DOSE RESPONSE/DRUG RECEPTOR THEORY

1. Calculate a dose response curve from basic data and interpret the curve.

2. Describe the concept of drug receptor kineteics, e.g., in the case of blocking drugs - recognize competitive and non-competitive inhibition of a receptor.

3. Compare dose response curves for beneficial and adverse effects of drugs, i.e., therapeutic index.

4. Explain physical dependence and drug tolerance on the basis of drug reception theory.

DRUG METABOLISM

5. Name the important metabolic pathways by which drugs are modified.

6. Identify the metabolic pathways which convert drugs to inactive forms and those metabolic pathways which convert drugs to active forms.

7. Recognize differences in drug metabolism related to age, sex, and genetic make-up.

8. Recognize possible drug interactions between two or more drugs involving metabolic pathways (e.g., phenobarbitol and dicumerol).

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9. Calculate plasma levels of drugs from an understanding of the kinetics of drug elimination.

10. Determine dosage regime required to maintain a given plasma level of a drug.

11. Discuss the effects of prototypical drugs on whole body physiology and pathology, e.g., Barbituate intoxication and its effects on the body.

12. Distinguish between the desirable and undesirable effects of drugs.

13. Contrast drug actions in normal and abnormal individuals.

14. Name the important general anesthetic agents.

15. Explain the factors involved in the differences in time of onset of anesthesia in terms of the physical-chemical properties of the general anesthetics (e.g., lipid solvability).

University of Connecticut Health Center
Committee on the Curriculum

Subject Committee Chairman: R. Wintrob
Curriculum Committee Chairman: C. Gjerde PSYCHIATRY CLERKSHIP

EDUCATIONAL GOALS AND OBJECTIVES

OBJECTIVES

SKILLS

1. Collect a pertinent life history and psychiatric case history from the patient and his relatives. Competent history-taking includes the following: Assessment and recording of the chief complaint, present illness, past medical and psychiatric history, family history, data on infancy, early childhood physical, and psychological growth and development, school history, work history, social and sexual history, current social, familial and occupational history. Pertinent information relating to chief complaint, presenting social, familial and occupational stresses relating to the chief complaint, outline of significant interpersonal relationships and social role functioning constitute a part of the psychiatric history. Elements of the history are obtained from the patient, the patient's relatives, friends and other informants knowledgeable about the patient.

2. Perform a mental status examination. Report on the mental status examination will include data on appearance, behavior and level of rapport, speech content, content and quality of thought process, mood and affect, orientation, memory, judgment, insight. Mental status examination should conclude with a summary of the pertinent findings.

3. Formulate a succinct and inclusive problem list. The problem list expresses the correlated data of life history, psychiatric history and mental status examination. It includes or is preceded by a formulation of the major interpersonal and intrapsychic conflicts experienced by the patient in relation to his presenting symptoms and in relation to earlier stages of psycho-social development.

4. Formulate a plan of management for each item on the problem list. The plan of management will include an outline of further data to be collected and its significance to advancing the plan of management, further laboratory, psychological and other diagnostic tests to be performed and their contribution to advancing the plan of management, and indications for psychotropic drugs and/or psychotherapy, and the indications for involvement of other health professionals and social agencies whose contribution could significantly advance the plan of management.

5. Demonstrate sensitivity and effectiveness in establishing rapport with patients and their families, to the extent that permits the collection of information relating to skill objectives 1-4 above.

6. Assume the role and a graded degree of responsibility consistent with the model of the primary care physician in the management of emotional dis-

orders. The median level of responsibility expected of students by the end of their clerkship is a formulation of the problem list and plan of management (objectives 3 & 4 above) and the ability to function as a member of the clinical team under the direct supervision of psychiatric house staff and attending psychiatrist.

7. Communicate the information obtained in items 1-5 by means of a written case history and through oral presentations at ward rounds and case conferences.

8. Record progress notes in the patient's chart, specifically relating to the problem list and plan of management.

9. Perform clinical evaluation of psychiatric emergencies under the supervision of house staff, attending staff and/or other mental health professionals.

10. Evaluate the need for voluntary vs. involuntary hospitalization of psychiatric patients, assess the need for crisis management and for extended care of the types of psychiatric problems listed in item 11 below.

11. Examine the following types of psycotic patients: schizophrenia, severe depression, organic brain syndrome, manic-depressive psychosis. Examine the following types of neurotic patients: anxiety, depression, personality disorder.

12. Assess the impact of his/her own personality on his/her relationship with a given patient in situations of evaluation of psychiatric emergency, life history and psychiatric case history taking, psychotherapeutic interview.

KNOWLEDGE

13. Define, describe the major clinical features of, and recognize in patients he/she examines the principle psychiatric syndromes listed in SKILLS, item 11 above. Define, describe the clinical features of, and discuss the psychosocial dynamics of phobic, obsessive compulsive and hysterical neuroses, and evaluate suicide risk.

14. Compare and contrast the broad outlines of the following theories of personality: Freudian, Eriksonian, social learning.

15. Apply to all patients interviewed a psychodynamic formulation of problems incorporating one or more of the theories in item 14 above.

16. Define, describe, and give the major indications for individual, conjoint and family psychotherapy.

17. Discuss the socio-economic and cultural factors in the development, management and prevention of mental illness.

18. Outline the relationship of psychosocial conflict to the development and management of psychosomatic disorder, with particular reference to peptic ulcer, ulcerative colitis, asthma, rheumatoid arthritis, cardiac illness.

PC

19. Name the major categories of psychiatric drugs, outline their indications, general mode of action and side effects.

20. Evaluate risk of suicide in terms of epidemiology of suicide and factors of age, race, sex, previous history, method of attempted suicide and fantasies about death of a particular patient.

21. Outline the leagal criteria and psyciatric/medical indications for emergency involuntary hospitalization of the mentally ill.

ATTITUDES

22. Demonstrate sensitivity and tolerance in interviewing patients and their families.

23. Show flexibility in supervisory relationships and in working relationships with peers and other staff members.

24. Assess ones own strengths and limitations in interviewing and managing the types of psychiatric problems listed in SKILLS, item 11.

University of Connecticut Health Center
Committee on the Curriculum

Subject Committee Chairman: P. Goldblatt
Curriculum Committee Chairman: C. Gjerde

RENAL-URINARY

EDUCATIONAL GOALS AND OBJECTIVES

GOALS

* Understand how the kidney regulates the internal environment of the body and how disease alters its regulatory function.

* Recognize the structural correlates of the individual functioning parts of the nephron.

* Consider the urine as an important indicator of body functioning and an important diagnostic tool in health maintenance both in medicine and dental medicine.

OBJECTIVES

NORMAL STRUCTURE

1. Recognize a kidney, locate a kidney in a human body and on an x-ray.

2. Sketch a normal kidney to scale (including the cortex, medulla, pelvis) also locating the urinary bladder and ureter.

3. Describe the organization of the nephron, describe its component parts and their function.

4. Discuss the blood supply to the nephron, recall that each nephron is supplied in total by one blood vessel.

5. Explain the development of the kidney, and discuss the consequences which failure of the dual origin has on the functioning adult kidney. (Recall that the pelvis of the kidney, ureter, and urinary bladder are related in terms of structure and origin).

6. Describe the fine structure of the cells of each of the major parts of the nephron (glomerulus, proximal tubule, loop of Henle, distal tubule, collecting duct).

7. Explain how the fine structure relates to the function of the individual components.

NORMAL FUNCTION

8. Recall the normal limits of total body water, electrolytes, and non-electrolytes (composition of body fluids).

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9. Describe and explain how the kidney regulates the composition of the body fluids.

10. Discuss how water and solute pass from one body compartment to another, e.g., intravascular, extravascular.

11. Explain how the kidney regulates the concentrations of individual components of the body fluids, e.g., water, sodium, potassium, calcium, protein, organic acids.

12. Explain the various processes by which the kidney accomplishes its regulatory function (filtration, re-absorption, secretion) and give examples of substances that are handled in each of these ways by the kidney.

13. Explain the concept of "clearance".

14. Calculate the clearance for a variety of substances and explain the significance of the differences of clearance values.

15. Explain how the composition of the urine, as the principle product of the kidney reflects kidney function.

SPECIFIC REGULATORY FUNCTIONS

16. Discuss the role of the kidney in acid-base regulation and its relationship to the respiratory system.

17. Explain the way in which the kidney regulates sodium concentration in the extracellular fluid.

18. Explain how the kidney relates to regulation of blood pressure (hormonal, volume control).

19. Define: Renin, angiotensin, the aldosterone system and relate the aldosterone system to blood volume and pressure control.

20. Describe the relationship between the hypothalmus and pituatory and kidney (anti-diuretic hormone, ACTH).

21. Explain the action of the anti-diuretic hormone on renal tubular function.

22. Explain the way in which the kidney handles organic acids and what significance this has in total body pH regulation.

23. Describe the renal mechanism for regulating divalent cation concentrations (calcium, magnesium) and its relationship to bone matabolism (parathormone).

24. Recall the distribution of blood vessels in the kidney and relate this to autoregulation of renal blood flow.

ARTIFICIAL DIURESIS

25. Name the various types of drugs which affect renal water and solute handling. For each of these classes explain the mechanism of action in terms of the effect normal physiological functioning of the kidney.

26. Name a specific drug which exemplifies each separate basic mechanism of diuretic action.

ALTERED STRUCTURE

27. Define glomerulonephritis, describing its pathogenesis, its pathologic anatomy, and its functional consequences.

28. Explain the major immunologic mechanisms involved in the development of glomerular injury (circulation antigen-antibody complex; antibasement membrane antibodies).

29. List the patterns of structural response in the glomerulus and relate these to the pathogenetic mechanism (focal, segmental, proliferative, exudative, rapidly progressive, membranous).

30. Relate the pathologic change in the glomerulus to altered renal function and explain how damage to the glomerulus may ultimately be reflected in altered tubular function.

31. List conditions which affect renal-vascular and describe how these may also affect total kidney structure.

32. Recognize and identify the major congenital abnormalities in renal structure which may affect renal function.

33. Discuss the organisms which may infect the kidney and describe the various patterns of renal-structured response to bacterial infections.

34. Explain the pathogenesis of bacterial infection of the renal urinary system (kidney, ureter, bladder).

35. Describe the neoplastic diseases of the renal-urinary system and relate these to possible alternations in renal function.

ALTERED RENAL FUNCTION

36. Describe how progressive structural damage to the kidney results in altered renal function (nephron deletion hypothesis). Alternatively, describe how structural alteration in selected parts of the nephron might alter renal function. Finally, explain the consequences of either of these for total body homeostasis.

37. Given a set of altered concentrations of body fluid constituents, analyze the alterations and relate them to abnormalities of renal structure and function.

38. Explain the mechanical factors involved in excretion of the urine after it leaves the kidney.

39. Identify diseases which may affect the ability to excrete urine normally and describe the consequences in terms of altered renal function.

University of Connecticut Health Center
Committee on the Curriculum

Subject Committee Chairman: R. Sha'afi
Curriculum Committee Chairman: C. Gjerde

RESPIRATORY

EDUCATIONAL GOALS AND OBJECTIVES

GOALS

PHYSIOLOGY

* Understand respiratory physiology and chemistry.

OBJECTIVES

PHYSIOLOGY

1. Recall the various lung volumes and capacities. (e.g., total lung capacity, vital capacity, reserve volume).

2. Recall the volume which the spirometer can measure.

3. Explain the dilution principle for measurement of volume.

4. Discuss the relation between volume and transpulmonary pressure under static conditions. In the discussion, include the roles of elastin, collagen, surface tension, and surfactant.

5. Discuss the interplay between surfactant, surface tension, and lung dryness.

6. Discuss the alteration in the volume to pressure relation in disease (emphysema, fibrosis, respiration distress syndrome in infants).

7. Discuss the relationship between pressure and lung volume under dynamic conditions. Identify from the curve the maximum muscle inspired pressure and maximum muscle expired pressure.

8. Identify the static factors which determine total lung capacity, reserve volume and functional residual capacity.

9. Identify the factors governing airway resistance.

10. Explain the interplay between lung recoil, airway diameter, pleural pressure, and intra-airway pressure in determining maximal respiratory flow.

11. Discuss the effect of gravity on the distribution of transpulmonary pressure between the apex and the diaphragm.

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RES

12. Recall the interrelation among pressure, temperature and volume in gases. (e.g., Boyle's, Charles's laws).

13. Define partial pressure and water vapor pressure.

14. Use the gas equations to calculate dead space, and the respiratory exchange ratio.

15. Recall total lung capacity, volume dead space, tidal volume of an average adult.

16. Identify the functional role of pulmonary circulation.

17. Identify the relationships between structure and function of the various branches of pulmonary circulation (arteries, capillaries, veins, etc.).

18. Discuss the underlying forces that contribute to the differences in the distribution of blood flow along the capillaries from the apex to the diaphragm, and the effect of high altitude on the distribution.

19. Discuss the effects on pulmonary circulation of (a) respiratory cycle, (b) light exercise, (c) heavy exercise and (d) high altitude.

20. Recall Graham's law.

21. Identify the various structures that are traversed by CO_2 and O_2 in going between the alveolus and blood.

22. Recall the diffusion capacity and identify the factors that influence it.

23. Discuss the transport of O_2 and CO_2 by blood (oxygen dissociation curve, CO_2 dissociation curve, gas exchange in the tissue).

24. Discuss the distribution of ventilation and perfusion ($\dot{V}/\dot{Q}$ ratio) along the lung from apex to diaphragm.

25. Discuss the role of the lung in acid-base regulation in the body. Recall the pH bicarbonate diagram and locate the points of respiratory acidosis and respiratory alcolosis.

GOALS

PATHOPHYSIOLOGY

* Correlate respiratory physiology with both microscope and gross physiology and isolate the critical pathophysiologic defects.

* Appreciate the pathophysiology involved in primary and secondary vascular disease.

* Appreciate common abnormal respiratory patterns which are produced by non-respiratory disorder (anxiety, fever, congestive heart failure).

OBJECTIVES

PATHOPHYSIOLOGY

26. Find and determine normal values for the lung volumes and capacities.

27. Recognize the limitations of the techniques and instrumentation that are used to measure lung compartments.

28. Identify a recognizable pattern of volume abnormalities (e.g., diffuse fibrosis vs. emphysema).

29. Identify the flow measurement components, the common methods of measurement, and the patterns characteristic of the major disease subgroups (e.g., post-viral smell airway disease vs. asthma vs. bronchitis).

30. Identify in the patient and estimate the elements that make up respiratory work and describe how it presents as a physiologic abnormality.

31. Identify respiratory failure and the mechanisms involved, and correlate that with the specific physiologic abnormalities.

32. Identify the abnormal physiology of pulmonary embolism and its natural time course.

33. Predict the physiological abnormalities seen in the chronic vascular disorders and identify appropriate tests to follow their course.

34. Describe the normal ventilation/perfusion relationships in the lung, their effect on blood gas levels, and how they are affected by posture, specific diseases, and common treatment modelities.

35. Describe the response of the vascular system to commonly employed drugs (Atropine, the sympathonometic drugs, naturally occuring catacholamines).

36. Describe the effects on tissue metabolism of abnormal arterial O_2 levels, CO_2 levels, and pH changes.

37. Describe the major mechanisms in abnormal O_2 transport in common exemplary models of pulmonary disease.

38. Describe common acid-base balance abnormalities (e.g., respiratory or metabolic acidosis, respiratory or metabolic alcolosis), their effects on body tissue, and body's compensation mechanisms (i.e., buffer capacity).

39. Describe the central and peripheral respiratory control mechanisms, the normal response of each in the common respiratory disorders.

40. Describe common disorders that primarily affect the respiratory control mechanisms (e.g., drug overdose, obesity, diffuse lung disease).

41. Describe and grossly differentiate commonplace causes for upper airway instruction and recognize the classical upper airway obstruction presentation.

RES

42. Recall the non-respiratory functions of the lung (e.g., water exchange, heat exchange, production and breakdown of biochemical mediators).

43. Describe the common defense mechanisms of the lung against particulates (minerals, metal, gases, bacteria).

44. Describe representative forms of organic dust diseases.

45. Describe the common allergic disorders and the physiologic mechanisms responsible - including a simple classificaiton of the types of disorders.

46. Recall the rational applications of specific groups of drugs and identify their characteristic sites of action.

47. Recognize major landmarks on the chest x-ray (heart, size and configuration; normal diaphragm levels; normal vascular patterns) and more typical patterns of abnormality produced by the common model disorders - (pneumonia, embolism collapse, emphysema).

48. Synthesize volume and flow studies with arterial blood gas and pH levels to identify major groups of respiratory disorders.

49. Given the x-ray presentation, presenting symptoms, and complications, identify the most likely form of tumor.

50. Cite the tumors which relate to cigarette smoking.

51. Recall the common effect of cigarette smoking and other pollutants on the lung and lung function.

52. Recall the mode of inheritance, the biological defect as it is understood, the major clinical abnormalities and their pathophysiology, and the rationale of applied therapy to cystic fibrosis.

53 Describe the common pediatric upper and lower respiratory viral infections.

54. Describe the pathology of primary and reactivation tuberculosis, including the usual complications and their presentation on the chest x-ray (e.g., retraction of structures due to fibrosis, cavitation, pleural disease).

55. Explain the basis for the tuberculin skin test, its application and interpretation.

GOALS

PATHOLOGY

* Be familiar with the structural alternations, gross and microscopic that underlie clinical disease of the respiratory system.

* Understand how these morphologic changes alter the respiratory function, and how they give rise to the clinical manifestations of disease.

RES

* Understand how the etilogic agents of disease produce the changes in function.

* Recognize major disease processes, as pneumonia, emphysema, tuberculosis, interstitual fibrosis, carcinoma by gross and microscopic examination of lung tissue.

OBJECTIVES

PATHOLOGY

56. Describe the sequence of alterations that take place in lung tissue after infection by bacteria, such as pneumococci.

57. Explain how these changes produce cough, sputum, chest pain, altered physical signs in chest, x-ray changes, and changes in repiratory function.

58. Define the essential morphologic lesion of chronic bronchitis.

59. Explain how chronic bronchitis produces serious and progressive deterioration in pulmonary function and cor pulmonale.

60. Describe on the lobular level the essential morphologic alterations of obstructive emphysema.

61. Distinguish between centrilobular and panlobular emphysema.

62. Discuss how the anatomic lesion of emphysema produces obstruction to expiration, decreased arterial blood oxygen, increased carbon dioxide, and pulmonary hypertension.

63. Discuss several theories of the pathogenesis of chronic bronchitis and of emphysema.

64. Describe the sequence of events that leads to infunction after embolic obstruction of a pulmonary artery.

65. Relate the morphologic changes of silicosis to the functional abnormality.

66. Describe the various basic histologic types of bronchogenic carcinoma.

67. Discuss the role of various etil ¿ic agents that may relate to them.

68. Describe the modes of spread of carcinoma of the lung.

69. Describe a tuberculose granuloma.

70. Explain the recent decrease in incidence of and mortality from pulmonary tuberculosis.

71. Describe the effects of abrupt obstruction of a bronchus as related to size of bronchus and degree of obstruction (partial or complete).

RES

72. Explain the effect on respiration of various kinds of pneumothorax.

73. Define bronchiectasis and state a theory of its pathogenesis.

(Unfinished)

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University of Connecticut Health Center
Committee on the Curriculum

Subject Committee Chairman: N. Doherty
Curriculum Committee Chairman: C. Gjerde

SOCIAL AND BEHAVIORAL SCIENCES

EDUCATIONAL GOALS AND OBJECTIVES

OBJECTIVES

1. Formulate a conceptual framework for understanding human motivation.

2. Define human motivation and recognize its essential features.

3. Identify at least one principal way in which unconscious motives characteristically manifest themselves.

4. Apply awareness of motivational factors to his or her own career choice and for a better understanding of clinical phenomena.

5. Distinguish between the emotional and motivational components of behavior.

6. Characterize emotional states both qualitatively and quantitatively and identify their physiological, behavioral and experiential concomitants.

7. Discriminate normal fear from pathological anxiety.

8. Define and describe: stress, conflict, anxiety and defense mechanisms.

9. Deal with the most important theoretical views linking stress to illness, somatic as well as psychic.

10. Distinguish between the functions of the conscious and unconscious mind.

11. Describe reality testing, functions of the ego, the defense mechanisms.

12. Compare and contrast the different mechanisms of ego defense.

13. Identify, describe and evaluate the principal means by which behavior is acquired, in terms of social learning formulations.

14. Delineate the component processes of observational learning.

15. Identify and illustrate the relationship between observational learning and the performance behavior.

16. Describe and illustrate modeling influences on social learning.

17. Outline the principles of stimulus, reinforcement and cognitive control of behavior.

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18. Illustrate types of disorders arising from inappropriate control of behavior.

19. Explain the concept of social learning as a reciprocal influence process.

20. Identify, define and illustrate the basic properties of cognitive functioning.

21. Define the nature of cognitive structures (schemes).

22. Identify the major cognitive achievements and limitations in Piaget's development periods.

23. Discuss the role of egocentrism and perspectivism in the course of cognitive development.

24. Identify and evaluate the contributions of regulatory processes in cognitive development.

25. Identify developmental achievements in person perception, moral judgment and attitude formation.

26. Discuss the role of cognitive development in children's concepts of death, illness and health.

27. Compare and contrast social learning theory with other theories of personality, e.g., Eriksonian and Freudian with Bandura's social learning theory.

28. Define the concepts of psychosexual and psychosocial development, morality, basic trust, mutuality, autonomy, shame, doubt and guilt as they are used in the analysis of personality formation.

29. Identify the contribution of each of the above concepts to the development of normal and abnormal personality.

30. Define the concepts of initiative, peer group formation, industry, inferiority and oedipal conflict as factors in personality development.

31. Formulate concepts of personality development and apply them to the examination of individuals and their families.

32. Define the concepts of socialization, social role, sex role, role expectation, role fulfillment, primary group and secondary group, norm and stereotype.

33. Describe the process of socialization in sociological and social learning theory terms.

34. Distinguish the qualities of masculinity and femininity on the basis of the theoretical constructs of the social learning and sociological approaches.

35. Discuss the process and function of stereotyping.

36. Delineate the formal and informal processes of socialization performed by a variety of socializing agents.

37. Define the concepts of the nuclear and extended family.

38. Compare and contrast the family structure of the nuclear and extended family, distinguishing the strengths of each.

39. Recognize the cultural and ecological determinants of family structure and function.

40. Identify the characteristics of "disorganized" families and their impact on individual personality function.

41. Describe the functions of marriage in cross-cultural perspective.

42. Describe recent changes in family structure and function and analyze socio-cultural factors related to these changes.

43. Apply the concepts of normal family structure and function to a general evaluation of family pathology.

44. Describe family structures which have been developed as alternatives to the nuclear family and the primary objectives of each.

CLINICAL APPLICATION OF PERSONALITY AND FAMILY THEORY

45. Conduct an interview with an individual and his or her family in which you apply the concepts of personality development and family structure and function.

46. Collect data relevant to personality function at each stage of the individual's life cycle, with particular reference to the pre-school and early school years.

47. Organize the data collected from individuals and families in order to assess the items of greatest importance (with respect to current adaptation).

48. Formulate an approach to intervention for the individual and/or family to reduce stress and improve function.

49. List types of behavior classified as preventive, curative and rehabilitative required of people.

50. Indicate behavior which people carry out to prevent, deal with, and recover from illness.

51. Indicate why people behave as they do in regard to preventing, dealing with and recovering from illness including: a) intra-psychic definitions of self and relation to family, b) socio-cultural and socio-economic factors, c) sex-role factors, d) definitions of causes and outcomes of illness, and d) attitudes and beliefs about illness.

52. Provide assessment of the effects of learning and reinforcement theories on changing health and illness behavior.

53. Provide assessment of the effects of group procedures on changing health and illness behavior.

54. Provide assessment of the effects of mass communication on changing health and illness behavior.

55. Provide assessment of means by which health professionals deal with rehabilitation after serious illness and factors which dictate these means.

56. Identify and discuss means by which the hospital as an institution deals with: a) Illness prevention, curative medicine and dentistry, and rehabilitative medicine and b) The extent to which the hospital appears to deal with preventive health behavior, illness behavior, and behavior after serious illness.

57. Identify and indicate activities of formal and voluntary health organizations as they deal with: a) illness prevention, curative medicine and dentistry, and rehabilitative medicine and dentistry and b) understand factors within and among these organizations which enhance and/or reduce productive activities.

58. Indicate activities of standard health professionals in dealing with: a) illness prevention, curative medicine and dentistry, and rehabilitative medicine and dentistry, and b) health behavior, illness behavior after serious illness.

59. List factors which have led to the emergence of new health professionals and list reasons and means by which the standard health professionals enhance and/or restrict activities of new and emerging health professionals.

60. Describe the state of health of the US population using such indicators as: life expectancy and infant mortality, acute and chronic diseases.

61. Compare the health status of various groups in the US, defined by sex, income, race, age, residence.

62. Explain some major causes of differences in health status in the USA.

63. Define and differentiate between "need" and "demand" for health care.

64. Compare the distribution of major health resources among population groups.

65. Explain some major causes of the current manner by which health resources are distributed in the US.

66. Compare current US expenditures for health care with those of ten years ago on a per capita basis and in relation to total national income.

67. Describe and account for the change in the proportion of health expenditures borne by the public and private sectors during the last ten years.

68. Describe the distribution of expenditures among the institutional, labor and other components of the health care delivery system.

69. Describe the methods used to pay for health services.

70. Appraise the effect of payment methods on the patient's access to health care.

71. Define and differentiate between a national health insurance program and a national health service.

72. Describe the Canadian National Health Insurance Plan and the British National Health Service.

73. Analyze the differences between the Health Security Act and the Comprehensive Health Care Insurance Act.

74. Discuss the economic characteristics of health services that differentiate them from "ordinary" services, e.g., haircuts.

75. Describe the roles of the private and public sectors in the health care system.

76. Define economic characteristics of the health system as they apply to children's care in Hartford.

77. Illustrate the effect of the interface between private and public health care on services provided for Hartford children.

78. Describe the limits of medical science in resolving health problems.

79. Identify major groups that exert political influence on the health care system and describe their primary motives.

80. Describe the interrelations among process, structure, and outcome as components of quality of health care.

81. Describe and appraise methods used to monitor the quality of health care.

82. Explain how a physician or a dentist running his own practice can respond to an increase in demand for his services.

83. List the essentials of the new health planning legislation.

84. Demonstrate three ways in which planning can be used to change the structure of the delivery of ambulatory medical and dental services.

85. Discuss the advantages and disadvantages of team delivery of services from patient, professional and economic viewpoints.

S&BS

86. Describe differences in types of medical and dental practice and practice settings.

87. Describe the influences of the different modes of practice on resolving health care problems in the United States.

88. Describe and appraise major recent changes that have occurred in health care delivery in Hartford.

89. Identify emerging problems in the Hartford area and their potential for solution.

University of Connecticut Health Center
Committee on the Curriculum

Subject Committee Chairman: G. Sigman
Curriculum Committee Chairman: C. Gjerde

SURGERY CLERKSHIP

EDUCATIONAL GOALS AND OBJECTIVES

OBJECTIVES

1. Prepare yourself to enter a sterile environment.

2. List the surgical procedures commonly seen in an outpatient or emergency room setting; describe the anatomy, the pathophysiology, and techniques for handling them (e.g., sebaceous cyst, paronchia, ingrown toenail, pilonidal sinus, puncture wounds, etc.).

3. Describe how angiography can help in the diagnosis and management of surgical lesions of the head, chest and belly.

4. Recognize post-operative complications of surgical causes and describe how to deal with them (Atelectasis, urinary retention, wound infection, ileus and dehiscense).

5. Describe the diagnosis of a pulmonary embolus; identify the kinds of people most likely to have them, and describe the treatment.

6. Describe the nutritional management of pre-operative and post-operative patients (e.g., a severely dehydrated patient with acute appendicitis).

7. Contrast differences in wound care depending on location and type of lesion. Describe the factors which influence management (hot vs. cold; elevate or not; length of suture; blood supply to area).

8. Given a patient with acute abdominal pain, describe the methods for ascribing the pain to a particular organ system, and then plan therapy.

9. Describe and plan the management of problems of the biliary system (gallstones, jaundice).

10. Describe the location of hernias, distinguish those which need surgical therapy and tell why.

11. Recognize a bowel obstruction, locate it, classify the etiology, and plan the surgical management.

12. Calculate the percentage of body surface area burned, determine the fluids needed, and manage the chronic problems associated with burns.

13. Describe how to recognize a high risk patient of breast cancer, perform a breast examination, teach a female patient to perform a breast self-examination, and decide how to convey your findings to the patient.

June 6, 1975

14. Describe how to recognize a patient with circulatory problems of the lower extremities, diagnose the particular type of difficulty and the nature of the arterial insufficiency (blockage of vessel), plan therapy for the patient.

15. Identify patients with gastric or duodenal ulcers, describe the pathogensis, and describe the possible complications of these problems. Identify the source of the bleeding and the best type of intervention.

16. Recognize these major inflammatory diseases of the intestinal system and describe their pathophysiology: diverticulitis, ulcerative colitis, Crogn's disease. Describe the surgical and medical management of the patient.

17. Recognize and describe the pathogenesis and the modality of therapy of anal-rectal diseases (hemmorrhoids, fistulas, fissures, rectal bleeding).

18. Describe the priorities of emergency room trauma. List the three things that must be controlled as top priorities.

19. Describe what types of patients may require amputation, the prosthetic devices that are available, and educate the patient as to what he can expect.

20. Describe how to examine the head and neck for tumors, determine the need for biopsy of the mass, and describe the therapies available.

21. Describe the type of reconstructive surgery available to patients with valvular heart disease, with congentital heart disease, with acquired coronary heart disease.

22. Recognize that the physiological mechanisms of the neonate are very fragile. Describe the surgical problems that may arise in the neonate; make the specific diagnosis and plan therapy (within a 12 hour period).

23. Describe the endocrinopathies that can be resolved by surgical intervention.

24. Describe the situations which produce painful or red eye, differentiate between these problems: glaucoma, cataracts, retinal surgery.

25. Describe the treatment for nose bleeding and for sinusitis.

26. Describe the types of hearing defects which are preventable and which are surgically correctable, discuss the types of hearing devices that are available today.

27. Describe the responsibilities of the anesthetist in pre-, inter-, and post-operative care of the surgical patient. List the pre-operative medications which may be of use inter-operatively.

28. Describe how the anesthetist groups his patients into high, medium, and low-risk anesthetic cases.

29. Discuss how to recognize trauma or infection of the upper and lower extremities through the history and physical examination.

30. Describe how to make specific diagnoses among contussion, sprain, and fracture.

31. In a multiple trauma case, discuss which problems must be treated first.

32. Recognize that the active athlete with orthopedic trauma may require earlier orthopedic intervention than the person who does not make his living in sports.

33. Describe the orderly sorting out of back pain (e.g., bone pain, myocytis, bone lesion).

34. Define head injury, describe which types of head injury require observation, describe the neurological signs to be looked for, the diagnostic procedures which can be used, and the surgical procedures which may be indicated.

35. Describe the causes of obstruction of the renal-urinary system and list the diagnostic procedures which can be used to pin-point the location and etiology of the obstruction. Describe the management of tumors, stones, etc.

36. Define hematuria, tell what it represents, describe the differential diagnosis; discuss the management of the problem.

37. Describe the causes of shock and the differential diagnosis for shock.

38. Describe the maintainance of fluid and electrolytic balance in the management of a patient.

39. Describe how to use respiratory support devices.

40. Conduct yourself professionally in the operating room.

41. Perform a physical examination of the head and neck, including indirect laryngoscopy and pharyngoscopy.

42. Examine the eye.

43. Perform an examination for low back pain and perform radiographic procedures.

44. Administer intravenous fluids.

45. Perform nasogastric intubation.

46. Pass a urinary catheter.

47. Insert and remove sutures.

48. Perform local wound care of ulcers and infections.

49. Practice operating room and scrubbing techniques.

50. Perform an intravenous cutdown.

University of Connecticut Health Center
Committee on the Curriculum

Subject Committee Chairman: E. Henderson
Curriculum Committee Chairman: C. Gjerde

TISSUE BIOLOGY

EDUCATIONAL GOALS AND OBJECTIVES

GOALS

HISTOLOGY

* For identifying histological components, the student must observe carefully, describe precisely, recognize the difference between observation and interpretation, and justify interpretations made on the basis of observation.

OBJECTIVES

HISTOLOGY

1. Given a picture of any histological component, name the component and vice-versa. (Human organs, human tissues, most types of cells, the major intracellular structures).

2. Recall the major functions of any above-named histological components and recall their importance in the total body economy.

3. Explain how the morphology of each histological component enables it to carry out its function.

4. Describe the histogenesis of blood, connective tissue, cartilage, and bone.

5. Describe the mechanisms by which all tissues are repaired.

TRANSPORT

6. Distinguish between the various possible mechanisms of ion transport in a particular cell type.

7. Define diffusion, osmosis, Gibbs-Donnan equilibrium, equilibrium potential (Nernst's equation), permeability, flux.

8. Recall the Donnan ratio and the Nernst equation.

9. Distinguish between active or metabolically mediated ion transport and passive or electro-chemical ion transport.

10. Calculate the Donnan ratio for a particular ionic distribution and determine the particular ion or ions which appear to be in a Donnan equilibrium.

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11. Calculate the equilibrium potential or Nernst potential for all of the permeable ionic species in nerve, muscle, or red blood cells.

12. Discuss the relationship between ionic flux and electrical current.

BIOCHEMISTRY

13. Describe the structures, function and properties of the components of the connective tissue. (Collagen, elastin, glycosaminoglycans, glycoproteins).

14. Illustrate the biosynthetic pathway and catabolism of the components of connective tissue.

15. Explain the specific characteristics of the specialized connective tissues (e.g., bones and teeth, cartilage, eye, skin, tendon, blood vessels).

BLOOD

16. Recall the general components of blood.

17. Describe the general functions of the plasma proteins.

18. Describe the structure, function, and properties of the individual plasma proteins.

19. Summarize the origins of hemmorrhage and outline the general coagulation sequence.

20. Describe the structure, function, and properties of the individual clotting proteins and platelets.

21. Illustrate the sequence of events in clotting

22. Describe the structure, function, properties and components of the erythrocytes.

23. Describe the basic structure of hemoglobin and summarize its molecular properties (e.g., oxygen-binding).

24. Outline the synthesis and destruction of hemoglobin.

NERVE

25. Recall the unique biochemical properties of the nervous system (e.g., oxygen consumption and lipid content).

26. Outline the general structure of sphingolipids and list the specific sub-groups of the sphingolipids.

27. Outline the synthesis and degradation of the sphingolipids and give specific examples of diseases which affect their metabolism.

TB

28. List the ways in which the carbohydrate and amino acid metabolism of central nervous system tissue differ from other body tissues.

29. Describe the properties of the unique proteins found in nervous tissue.

30. Recall the physiological properties of nerve growth factor and its role in nervous system.

31. Discuss the functional role of nucleic acids in central nervous system activity.

32. Describe the organizational architecture of muscle at the light and electron-microscope levels.

33. Recall the structure, function and properties of the individual muscle proteins.

34. Illustrate the sliding filament theory of muscular contraction.

35. Identify the energy sources used by actively contacting muscle.

GOALS

AXONOLOGY

* To describe in detail the mechanism of electrical impulse conduction in nerve and muscle cells.

OBJECTIVES

AXONOLOGY

36. Calculate the resting electrical potential difference across any cell membrane, given the ionic distribution.

37. Evaluate the effects of changes in the ionic environment on the resting membrane potential and permeability co-efficients.

38. Describe the electrical characteristics of the resting membrane; e.g., capacitance, resistance, conductance, electrical potential.

39. Distinguish between the various methods of measuring resting potentials and measure membrane potentials by one method, i.e., extra-cellular recordings.

40. Explain the contribution of metabolic energy to the resting membrane potential.

41. Identify the particular ion or ions which are primarily responsible for maintaining the resting membrane potential.

42. Define depolarization and hyper-polarization.

43. Distinguish between local non-propagated electrical activity and regenerative electrical impulse propagation.

TB

44. Distinguish between stimulus and response as they apply to nervous condition.

45. Define threshhold, all-or-nothing law, overshoot, spike, negative afterpotential, positive afterpotential, refractory period, accommodation.

46. Distinguish between compound action potentials and intracellularly recorded action potentials.

47. Measure the compound action potentials, conduction velocity, and modifications of the latest environment on compound action potentials.

48. List the factors which influence conduction velocity, describe the relationship between conduction velocity and axon diameter, and define saltatory conduction.

49. Describe the ionic mechanisms underlying electrical impulse propagation in nerve and muscle cells and assess the effects of ionic environment modifications on the electrical potential and current manifestations of the impulse, (e.g., sodium and potassium currents, voltage clamp, directionality of currents, ionic effects on overshot and afterpotentials).

50. Explain what the voltage clamp allows you to measure in regard to electical impulse propagation.

51. Define inward current, outward current, activation, inactivation, peak current, late steady-state current.

52. Reproduce a current/voltage curve as measured in a voltage clamp experiment and describe the effects of various ionic, environmental changes and drugs (e.g., TTX,TEA) on the current/voltage relationship.

53. Discuss the contribution of metabolic energy to impulse propagation, (e.g., post-tetanic hyperpolarization).

GOALS

LOCAL ANESTHETICS

* Understand the uses to which local anesthetics are put in therapeutics, their potential toxic effects and their underlying mechanisms of action.

OBJECTIVES

LOCAL ANESTHETICS

54. Explain the types of chemical structures and how they influence drug metabolism, toxicity and duration of action.

55. Describe the effects of anesthetics on nerve membrane properties (e.g., ionic conductances, threshold, conduction velocities).

56. Recall the peripheral sensory nerve groups which transmit pain information.

57. Discuss selectivity of nerve groups which are blocked by local anesthetics and the underlying basis for differences in susceptability of the various axon groups present in a peripheral nerve.

58. Discuss potential actions of local anesthetics in the body aside from actions of peripheral neurons, especially those related to toxic effects.

59. Discuss the basis for treatment of local anesthetic toxicity.

EMBRYOLOGY

60. Explain the consequences of reduction division in gametogenesis.

61. Describe morphological characteristics of egg and sperm.

62. Explain the roles of the sperm and egg in fertilization.

63. Distinguish between the embryo proper and its embryonic membranes.

64. Describe the origins and derivatives of the three germ layers.

65. Describe the basic vertibrate body plan and the origins of its components.

66. Discuss the selective activation of genes during embryonic development.

67. Discuss causal factors in animal morphogenesis, (e.g., cell shape change, selective adhesive interactions, inductive interactions).

68. Carry out a series of techniques which are used, not only in experimental embryology, but also in tissue culture experiments (e.g., microdissection of embryos, cell dissociation, etc.).

69. Diagram and explain the results of tissue interactions <u>in vitro</u>.

<u>GOALS</u>

SYNAPTIC TRANSMISSION

* Classify the peripheral autonomic nervous system from the standpoint of anatomy, neurochemistry, physiology, and pharmacology.

<u>OBJECTIVES</u>

SYNAPTIC TRANSMISSION

70. Describe the important steps in transmitter autonomic nervous system from the standpoint of anatomy, neurochemistry, physiology, and pharmacology.

71. Discuss cholinergic and adrenergic transmission.

72. Describe the general pattern of sympathetic and para-sympathetic nerves.

73. Explain excitatory and inhibitory synaptic transmission.

TB

74. Recall the pharmacological classification of peripheral synapses and junctions.

GOALS

MUSCLE PHYSIOLOGY

* Understand the molecular basis for contractile activity and the specific characteristics of different types of muscles (cardiac, skeletal, smooth) and how their different properties are suited to specific functions.

OBJECTIVES

MUSCLE PHYSIOLOGY

75. Describe the structural and functional difference between cardiac, skeletal and smooth muscle, including differences in mechanical properties, mechanisms of excitation, innervation, and control by neurohumoral factors.

76. Describe mechanical properties of muscle (e.g., length vs. tension relationships, the active state, summation of twitches, tetanus, etc).

77. Describe the role of calcium in muscle contraction.

78. Describe the interactions of the muscle proteins with ATP and calcium.

79. Describe the roles of the T tubules and the sarcoplasmic reticulum in the regulation of muscle contraction.

80. Describe the entire sequence of events from excitation through contraction and eventual relaxation of a muscle fiber.

81. Describe at the electron microscope level the localization of various proteins, transport systems, and other features of the cell involved in excitation - contraction coupling.

82. Describe the role of the action potential in the regulation of muscle contraction.

83. Describe the different mechanisms for the regulation of contractile activity in skeletal, cardiac and smooth muscle, e.g., types of innervation, electrical excitability, hormonal control, etc.

GOALS

MICRO-CIRCULATION

* Understand the anatomical organization, physiological functions, regulatory control of, and pathological influence on the peripheral vascular bed.

OBJECTIVES

MICRO-CIRCULATION

84. Describe the anatomical organization of the circulatory system.

85. Describe the roles and functions of the various units of the circulatory system (e.g., heart, aorta, arteries, capillaries).

86. Describe the fundamental law governing hemodynamic relationships on the circulatory system (e.g., flow, pressure).

87. Discuss the meaning of resistance as compared to capacitance vessels.

88. Discuss the differential blood flow in various organs and effects of activity on blood flow on various organs and tissues.

89. Describe the important functions of the circulation system (nutritive, temperature regulation).

90. Discuss various mechanisms which control blood flow and regional distribution of blood.

91. Describe relative quantitative difference in exchange diffusion vs. net diffusion across capillaries.

92. Discuss Starling's Law of the Capillary and predict how various pathological conditions will affect net flow across capillaries.

93. Discuss the general actions of certain drugs (e.g., histamines, gradykinin) on control of microcirculation.

POLYGRAPH

94. Use the polygraph in monitoring physiological functions.

95. Describe the general principles of the operation of the polygraph--transducer, preamplifier, driver amplifier, recording mechanism.

Section II

DEVELOPING A CORE CURRICULUM

In 1973 the Committee on Undergraduate Medical Education at the University of Connecticut Health Center appointed a committee called the Core and Tracking Committee to explore with faculty from our 24 teaching committees the core competencies required in each of them and to make recommendations concerning mechanisms for increasing elective and tracking opportunities.

The Core and Tracking Committee set out to determine if there was a systematic way of looking at our curriculum. Our long-range goal was to collect data, using a judgmental approach, which would provide a rational basis for developing a core medical curriculum with the possibility of instituting a tracking system.

PLANNING

The early stages of the work on the project involved getting to know the medical environment and planning the best ways to proceed in getting the work done. A major concern was that we insert ourselves carefully into the environment, since we had to win the cooperation of the faculty and could not force anyone to cooperate with us. Thus, our first step was to conduct a round of interviews with some of the teaching committee chairmen, academic departmental chairmen, and members of our Core and Tracking Committee. We felt that it was important for them to hear our ideas about an explicit curriculum and for us to see the educational system of the Health Center through their eyes.

During these interviews we gained an understanding of the teaching organization and heard faculty opinions about what was right and wrong about our educational program and got their opinions about a "core"

curriculum. There was much contentment with leaving things as they were, and many persons felt that their teaching content already consisted of a minimal core. Our educational program was organized around organ systems, rather than the traditional academic departments; thus, committee chairmen were selected from the general faculty and persons from various departments were asked to teach on those committees. Only infrequently would the faculty who taught on the committee meet together to discuss the curriculum content.

Few committees had explicit teaching objectives--the curriculum was implicitly defined in the syllabus, a book which listed the topics for each of the class sessions and often contained outlines of the subject matter, supplemental readings, and self-study materials. Often the chairman relied on the individuals who taught on the committee to determine their own curriculum content. At one extreme, the curriculum segment was determined by the teacher and there was no provision for review by other faculty. At the other extreme, the chairman and others planned the appropriate global content for the course and assigned lecturers to cover those topics. In clinical courses, the preceptors had concepts of curriculum content that were less explicit and much more varied.

Being a chairman demanded perhaps a month of planning time, plus the hours which the chairman was expected to spend in lecturing and in attending other lectures during his subject committee. Educational matters demanded much time--planning the course, developing schedules, writing tests, finding preceptors for labs, determining curriculum, ordering movies and library materials, attending meetings, tutoring students with problems, etc. These educational efforts were seen as having low visibility and little relation to promotion; time spent in research might be rewarded institutionally by promotion and nationally by publications and grants.

Thus, heading a subject committee was a task not always relished by the subject committee chairmen. While chairmen had the nominal responsibility for running the course, many felt they had little authority over their teaching colleagues.

The project director had no power over the people with whom he worked; he had to make his case as best he could and try to convince the chairmen (and through them, their teaching colleagues) that this effort of determining performance standards was worthwhile.

NEED FOR AN EXPLICIT CURRICULUM

As we conducted our interviews we built up a rationale for writing objectives. It appeared that in addition to serving the long-range needs of the Core and Tracking Committee, determining course objectives would be helpful to many constituencies at the Health Center.

Students

Focus on material: Students were often confronted with huge syllabi full of information which they were supposed to "know." Objectives could help them to focus on the important topics of study and help them to see some overall organization of the material; content outlines did not serve this need.

Teaching Faculty

Curriculum definition: Specifying objectives would define a curriculum in an explicit way. This explicit curriculum--as defined by a list of objectives--could be the basis for rational deliberation in which the discussion could be focused on specific points. These objectives could be reviewed by other teachers, by academic departments, by physicians, or by outside specialists.

Student evaluation: Faculty were concerned with the adequecy of the current ways of evaluating student learning. A list of objectives could serve as a basis for evaluating the student's skills and knowledge with test items based on specific objectives. (See Appendix A for an example). Attitudinal objectives could provide a basis for narrative evaluative comments needed to supplement our pass/fail grades.

Course integrity: Perhaps the best reason for having objectives was so faculty could (1) discuss what was important for the students to know and perform, (2) validate that decision by informed polling, and then (3) cooperate in trying to attain those objectives. (The informed polling is a critical step; only after objectives of a program are specified is it possible to determine priorities among those curriculum objectives through systematic rating by the teachers and by other professionals).

If faculty agreed on what they were trying to do, and if those things which they were trying to do were spelled out in some detail, it seemed more likely that faculty could successfully integrate the material into a meaningful course.

Having identified these needs for curriculum definition we had to determine a format for stating the objectives, decide on the language to be used in stating the objectives, and plan the later steps in the process.

METHODOLOGY

Format for the Objectives

After some review of the materials on writing objectives by Mager, Gronlund, and others, we developed a format for objectives:

1. All objectives would state the acts which STUDENTS would be required to accomplish. The implicit stem of each objectives would be "the student will be able to . . ."

2. Objectives would be time referenced to the end of the course. Thus, there was an implicit "at the end of the course . . ." associated with each statement.

3. The body of the objective would be composed of two essential parts - a behavioral verb and a bit of content. The verb defined the way in which a student might be appropriately required to demonstrate his achievement of the content which was specified in the objective.

4. The behavioral verbs could not be "know," "understand," or any one of several listed verbs which were subject to multiple interpretations. The verb had to be more of a behavioral sort, such as those found on a list of suggested verbs which we provide to writers (Appendix B).

Objectives were defined as descriptive statements which lay somewhere in specificity between the goal statement of "knowing biochemistry" and a listing of facts to be recalled. Faculty were encouraged to consider three types of objectives: affective, cognitive, and psychomotor—affective objectives were especially encouraged.

Scales for Ranking Objectives

After some deliberation of the dimensions on which objectives could be rated, we decided that objectives should be rated on their CLARITY (i.e., ability to clearly communicate to the reader the behavior which the student was expected to display in achieving the objective) and on the CENTRALITY* (i.e., the essentiality for every student in the program to achieve the objective). (See Appendix C)

Clarity: Each judgment of clarity included a recommendation to the Committee on what to do to improve the objective. The choices were:

JUDGMENT	RECOMMENDATION
Very Clear	Leave it Alone
Quite Clear	Could Tighten It Up
Varied Interpretations Possible	Needs Work
Somewhat Unclear	Revise
Very Unclear	Rewrite

Adapted from Bruce Spivey, "A Technique to Determine Curriculum Content," Journal of Medical Education, 46:269-74:71

Centrality: The other scale on which ratings were made was the scale on which reviewers could rate the Centrality or essentiality of each objective. The question was "how essential is it for every student in our program to achieve this objective?" The choices were:

Essential for all students
Desirable but not essential
Useful but should not be required
Unessential
I am unable to judge

This first rating was done only by members of the teaching committee whose objectives were being written and was done as a way of helping them to identify the objectives with which they did not agree on the appropriate content or level of student behavior. As faculty rated the objectives, they were invited to modify objectives, delete objectives, and add objectives.

Since the writing of the objectives was frequently done by small groups of 1 to 5 persons, this rating process allowed all the other 7 to 20 committee members to participate in the process and informed them of the curriculum deliberations going on within their committees. A consideration of the ratings usually lead to modified objectives. (See Appendices D and E for examples of the changes which took place during the preparation of two sets of objectives).

Working with Faculty

We decided to be flexible in our approach to working with faculty and allow serious deviations from our initial plans. As it turned out, it was easier to accomplish the task of getting objectives written by ignoring much of our initial plan: the chairman of the committee and two other persons seemed abuut the right number to work with; explaining objective writing and the cognitive, affective, and psychomotor domains took only

10 to 20 minutes. We did not need to devote much time exclusively to determining course content; general course content appeared to be well fixed in their minds. Deciding the appropriate behaviors for students was more difficult and led to discussion and compromise.

All in all, writing objectives did not seem as difficult as most people had expected. Four to ten hours were required for an average six week committee, and three hours at one stretch seemed to be the maximum tolerable time for this kind of mind searching.

In the working sessions we challenged the teachers to tell us what it was that they expected a student to be able to do by the end of their course — or conversely, what were the things which they would be unhappy about if students could not do them by the end of the course. The project director acted as secretary/catalyst/provocateur and wrote down their statements as they thought them out.

In some cases the faculty members referred to a copy of the syllabus or a class schedule to refresh their memories. Often the emergence of an objective would be prefaced by deep thought. Frequently the person would struggle for a minute in his mind with an objective, then choose a verb from the verb list to describe the way in which students could be asked to demonstrate their knowledge. (Not infrequently the project director would get little lectures on the topics). Most faculty soon became facile with with the groupings of cognitive verbs into six taxonomy categories.

Any objective considered important by the faculty person was accepted. although the clarity of the statement would be questioned if it were unclear or confusing to the director.

CONCLUSION

During these two years, persons from all of our 24 committees have prepared objectives. A few committees are not complete; most committee chairmen, however, were very conscientious and worked hard at the task. Five or six committees published their objectives in their syllabi. Some committees are using their objectives to develop performance standards for student evaluation; this phase of the work will be continued during the next two years.

Cross-judging of curriculum content will continue during the next year, although the appropriate judges have yet to be determined: they may be academic departments, practitioners, students, or other faculty groups.

Our current core curriculum is thus defined. Also developed is a systematic method for reviewing our curriculum. Such extensive interaction of our faculty in thinking about curriculum was last done seven years ago.

It is our hope that this explication of our curriculum objectives will help students to master the important skills and learning, enable our faculty to assist students in that learning, and provide a system for modifying curriculum content from time to time.

APPENDIX A

An example of curriculum objectives
used as a basis for test construction.

University of Connecticut Health Center
Committee on the Curriculum

Subject Committee Chairman: T. Joseph Sheehan
Curriculum Committee Chairman: Craig L. Gjerde

BIOSTATISTICS

EDUCATIONAL GOALS AND OBJECTIVES

OBJECTIVES

UNIT 1

1. Describe three measures of central tendency (mean, median, mode).

2. Calculate the mean of a group of numbers.

3. Use the "machine formula" to calculate variance and standard deviation of a set of numbers.

4. Describe two common measures of dispersion.

5. Describe and contrast the scales of measurement - nominal, ordinal, and interval.

6. Given the appropriate information, transform a raw score into its standard (z) score and vice-versa.

7. State the essential parameters needed to define a normal curve.

8. Evaluate expressions involving Σ, the summation operator.

9. Translate values of z to areas of the normal curve and vice-versa.

10. Describe two kinds of departures from normality.

UNIT 2

11. Determine whether two events are dependent or independent.

12. Use the addition and product roles in calculating binomial probabilities.

13. Determine whether a given attribute is distributed according to the binomial distribution.

14. Calculate probabilities using the binomial formula. Example: what is the probability that a random selection of 10 people will yield 6 with blue eyes if the probability of blue eyes is 0.4 in the general population.

15. Calculate the mean and variance of a binomial distribution.

16. Use the normal distribution to approximate binomial probabilities.

June 26, 1974

Appendix A

Biostatistics Test

B-2

T E S T 3

DO NOT WRITE ON TESTS
USE PAPER PROVIDED

(20) 1. Which of the following attributes are distributed according to the binomial distribution. Explain your answer.

A. sex
B. race
C. age
D. hair color
E. hand used to brusth your teeth
F. weight

(20) 2. If the five year survival rate for a particular disease is .60, what is the probability that exactly 2 of 3 patients with the disease will be alive at the end of five years?

(20) 3. In the general population, 12% of all people are left handed. In a random sample of 100 people, what is the probability of obtaining 80 or less right-handed people?

(20) 4. Using the binomial formula $\frac{n!}{r!(n-r)!} p^r q^{n-r}$ what is the probability that at least 2 of the 4 patients a physician is treating will survive if the fatality rate for the disease is 0.25?

(20) 5. Of 10 patients with a particular disease, what is the expected mean number of survivors if the survival rate is 0.35? Aslo calculate the variance and standard deviation for this distribution.

NOTE: On problems involving calculations, it is only necessary to set up the arithmetic.

DO NOT WRITE ON TESTS
USE PAPER PROVIDED

APPENDIX B

A list of suggested behavioral
verbs which was provided to faculty.

SOME POSSIBLE VERBS FOR USE IN STATING COGNITIVE OUTCOMES

Knowledge	Comprehension	Application	Analysis	Synthesis	Evaluation
define	discuss	compute	distinguish	diagnose	evaluate
list	describe	demonstrate	analyze	propose	compare
recall	explain	illustrate	differentiate	design	assess
name	identify	operate	compare	manage	justify
recognize	translate	perform	contrast	hypothesize	judge
state	restate	interpret	categorize	summarize	appraise
repeat	recognize	apply	appraise	compose	rate
record	express	employ	calculate	plan	revise
label	locate	use	test	formulate	score
	report	practive	criticize	arrange	select
	tell	schedule	diagram	assemble	choose
	transform	sketch	inspect	collect	estimate
	convert	prepare	question	construct	measure
	distinguish	modify	relate	create	argue
	estimate	predict	solve	organize	decide
		extrapolate	examine	prepare	criticize
			classify	modify	
			deduce	invent	
			outline	generate	

Some Verbs for Use in Stating AFFECTIVE Outcomes:

show sensitivity
accept responsibility
be willing to assist
respond to emergency situations
practice sterile technique
follow directions
accept differences
complete assignments
participate in discussions
enjoy an activity
demonstrate commitment
respect opinions
state an opinion
be present at night deliveries
observe three deliveries

Some Verbs for Use in Stating MOTOR Outcomes:

calibrate a polygraph
perform a pelvic examination
tie a square knot
locate a nerve
dissect a rat
weigh an infant
set up equipment

AVOID THESE WORDS: They have ambiguous interpretations -

knows
comprehends
thinks critically
understands
appreciates
has an interest in
fully appreciates
grasps the significance of

learns
respects
expands his horizons
works effectively
speaks effectively
speaks correctly
reads with ease
uses basic skills

APPENDIX C

Examples of the scales of Clarity and Centrality
on which objectives were rated.

THE UNIVERSITY OF CONNECTICUT
HEALTH CENTER

14 August 1974

Dear Biostatistics Participant,

The Biostatistics subject committee is cooperating with the Core and Tracking Subcommittee of CUME in specifying and obtaining ratings of its educational objectives. We never did get around to rating a final list of objectives. Would you please identify any missing objectives, modify objectives which might be poorly focused, and finally rate each of the objectives in terms of its clarity and in terms of its centrality or importance.

These are the scales on which you are asked to rate the objectives:

Clarity of Statement

How clearly does this objective communicate the behavior which the student is expected to display in achieving the objective?

Very Clear Leave it Alone	Quite Clear Could Tighten it up	Varied Interpretations Possible Needs Work	Somewhat Unclear Revise it	Very Unclear Rewrite it
9	8	7	6	5

Centrality in UCHC Curriculum

How essential is it for every student in our program to achieve this objective?

ESSENTIAL for all students	DESIRABLE but not essential	USEFUL but should not be required	UNESSENTIAL	I am unable to judge
4	3	2	1	0

After the suggestions and ratings are considered, the objectives will be shared with other subject committees. Please return your ratings in the envelope provided by mid-September.

Craig Gjerde, Ph.D.
Research in Health Education

SCHOOL OF MEDICINE
FARMINGTON, CONNECTICUT 06032

APPENDIX D

An example of the changes that took place in the Hematology objectives during their development.

D1 - First Hematology objectives written by four people (8-26-74)

D2 - Summary of ratings by five people (10-22-74)

D3 - Comments by raters to the chairman

D4 - Subsequent revision based on the ratings and comments

D5 - Copy of Hematology objectives as of November 7, 1974

Hematology

August 26, 1974

RED CELLS

1. Identify normal red cells and characterize the major abnormalities, including cytoplasmic inclusions.

2. Describe the morphologic criteria for distinction of stages of red blood cell development.

3. Define red cell indices and describe their limitations.

PHYSIOLOGY

4. Discuss the roles of DNA, RNA, cytoplasmic enzymes , organelles and hemoglobin in the life history of red cells.

5. Define factors regulating the blood cell production including erythropoietin, role of stem cells, hypoxia, and androgens.

6. Trace the fate of red blood cell breakdown products through their metabolic pathways.

7. Discuss the structure and function of hemoglobin, specifically including oxygen transport, function 2-3 DPG, oxygen dissociation curve.

ANEMIA

8. State a working definition of anemia, and discuss its physiologic implications.

9. Describe the three major types of anemia due to lack of nutrients or ineffective utilization of nutrients, including daily requirements, metabolism, means for identification of the anemias and the thereapy for each (iron, vitamin B_{12}, folic acid)

10. Discribe the mechanisms for production, approaches to diagnosis, and therapy for hemolytic anemias.

11. Describe a logical approach to diagnosing anemia.

12. Classify anemias on a morphologic basis and on a physiologic basis.

13. Discuss the qualitative and quantitative abnormalities of hemoglobin synthesis and their physiological implications--sickle cell disease, thalssemic syndromes, unstable hemaglobins, and variants with altered oxygen affinity.

14. Discuss the implications of abnormalities of red cell G-6 PD and PK deficiencies as models for abnormalities of glycolysis and oxidative metabolism.

15. Define polycythemia and differentiate the primary from the secondary form. Identify th physiologic bases of the secondary forms.

16. Discuss physiologic adaptations to anemia.

WHITE CELLS

17. Recognize the maturation stages of white cell development and correlate them with the functional compartments.

18. Define factors regulating production, release, and distribution of granulocytes (colony stimulating factor, leukocytosis inducing factor, endotoxin, epinephrine).

19. Discuss the role of granulocytes in phagocytosis and bacterial killing (chemotaxis, ingestion, functions of lysosomal and cytoplasmic enzymes), and explain defects of each function (chronic granolometis disease, Chediak-Higashi syndrome, lazy-leukocyte syndrome).

20. Define neutropenia and describe its mechanisms and consequences.

21. Define and distinguish between the four major kinds of leukemia (AML, ALL, CGL, CLL).

22. Describe the myeloproliferative disorders and their interrelationships.

23. Describe the clinical presentations of the acute leukemias and discuss the differential diagnosis of leukemia.

24. Discuss the roles of chemotherapy, radiotherapy, and supportive care in the treatment of patients with the leukemias.

25. Describe the categories of chemotherapeutic agents and their mechanisms of action.

26. Describe the life cycle of human lymphocytes and explain the basis for the categorization into 2 subpopulations (B and T cell).

27. List the functions of B and T cells.

28 Describe the lymphoproliferative syndromes and distinguish their different effects on normal physiology (infectious mononucleosis, lymphoma, multiple myeloma, macroglobulinemia).

29. Recognize that there is a classification of lymphoproliferative disorders which has prognostic and therapeutic significance for patients.

30. Describe the life cycle of a monocyte and its physiologic role.

CLOTTING

1. Describe the interactions of the clotting factors in the coagulation cascade. Identify the clotting factor act as a substrate, enzyme, co-factor, or initiating stimulus.

2. Describe the interrelationships between fibrinolysis and coagulation.

3. Recognize the relationships of these two pathways to the complement and kinin cascades.

4. Compare and contrast reactions of the enzymes thrombin and plasmin with the substrate fibrinogen.

5. Discuss the synthesis of the vitamin K dependent clotting factors--including the effects of drugs and gastro-intestinal diseases.

6. Describe how the following tests are done and which clotting factors they reflect (prothrombin time, partial thromboplastin time, thrombin time, euglobulin clot lysis time).

7. Discuss the molecular basis , genetics, and clinical presentation of the following diseases: classical hemophilia (hemophilia A), Christmas disease, Von Willebrands's disease, the dysfibrinogenemias, diseases of vitamin K deficiency, and disseminated interavascular coagulation.

8. Describe how each of the following agents interrupts or modifies the hemostatis and coagulation sequences: heparin, war farin, aspirin, darvon, strepto-kinase, epsilon aminocaproic acid, citrate.

9. Draw a platelet and identify the three functional zones.

10. Describe the sequence of events in primary hemostatis and discuss the platelet release reaction.

11. Discuss the life cycle of the platelet.

12. Discuss how the following tests are done and which deficiencies they can identify: clot retraction, bleeding time, platelet aggregation, platelet factor 3 release.

13. Contrast thrombocytopenia caused by diseases of reduced platelet production with that caused by diseases of increased platelet production.

14. Discuss the physiologic basis, genetic and clinical presentation of the following diseases: Glanzmann's thrombasthenia, storage-pool disease, aspirin-like disorder.

Blood transfusion

15. Contrast the ABO and Rh blood systems in terms of antibodies formed and the kinds of tests used to identify these antibodies.

16. Explain the process of blood typing and cross-matching and indicate why the follwing complications of blood transfusion are not prevented by these steps: hepatitis, fibrile reactions, development of irregular isoantibodies, thrombo-cytopenia.

17. Identify the individual components of whole blood which can be separated for specific administration.

18. Discuss the complications of massive transfusion therapy.

THE UNIVERSITY OF CONNECTICUT
HEALTH CENTER

22 October, 1974

Here are the ratings of the objectives of the Hemat'd committee. 5 persons rated the objectives as to their clarity and centrality according to the following scales:

Clarity of Statement: How clearly does this objective communicate the behavior which the student is expected to display in achieving the objective?					Centrality in UCHC Curriculum: How essential is it for every student in our program to achieve this objective?				
Very Clear Leave it Alone	Quite Clear Could Tighten it up	Varied Interpretations Possible Needs Work	Somewhat Unclear Revise it	Very Unclear Rewrite it	ESSENTIAL for all students	DESIRABLE but not essential	USEFUL but should not be required	UNESSENTIAL	I am unable to judge
9	8	7	6	5	4	3	2	1	0

You may wish to consider the comments of the raters and their ratings of clarity and centrality in developing the list of objectives which you wish to communicate to the faculty as the Educational Objectives of your committee.

Some schools use a centrality rating of 3.3 as the cutting point for exclusion of an objective and the clarity rating of 8.3 as the cutting point for revision of the wording; you, however, will be the final judge.

I would like to meet with you as you consider these data and develop your "final" list of objectives. (I recognize that the objectives of the course will and should change over time).

I will call you during the next week.

Craig Gjerde
ext. 2118
B-5058

Appendix D2

RATINGS OF OBJECTIVES

Instructions: After you read each objective, rate its clarity and its centrality. Feel free to revise any objective and to suggest additional objectives.

Name (optional) TALLY

Date: October 22 1974

Hematology August 26, 1974

RED CELLS

	Clarity of Statement (How clearly does this objective communicate the behavior which the student is expected to display in attaining the objective?) 9	8	7	6	5	Clarity	Centrality to MSMC Curriculum (How essential is it for every student in our program to achieve this objective?) 4	3	2	1	0	Centrality
1. Identify normal red cells and characterize the major abnormalities, including cytoplasmic inclusions.	2	1	1	1	4	7.8	5					5.0
2. Describe the morphologic criteria for distinction of stages of red blood cell development.	4	1				8.2	1	2	2			2.8
3. Define red cell indices and describe their limitations.	3	2				8.6	4	1				3.8
METABOLISM												
4. Discuss the roles of DNA, RNA, cytoplasmic enzymes, organelles and hemoglobin in the life history of red cells.	1	4				8.2	3	2				3.6
5. Define factors regulating the blood cell production including erythropoietin, role of stem cells, hypoxia, and androgens.	4	1				8.8	5					4.0
6. Trace the fate of red blood cell breakdown products through their metabolic pathways.	5					9.0	2	3				3.4
7. Discuss the structure and function of hemoglobin, specifically including oxygen transport, function 2-3 DPG, oxygen dissociation curve.	5					9.0	4	1				3.8
ANEMIA												
8. State a working definition of anemia, and discuss its physiologic implications.	4	1				8.8	5					4.0
9. Describe the three major types of anemia due to lack of nutrients or ineffective utilization of nutrients, including daily requirements, metabolism, means for identification of the anemias and the therapy for each (iron, vitamin B_{12}, folic acid).	3		1	1		8.0	5					4.0
10. Describe the mechanisms for production, approaches to diagnosis, and therapy for hemolytic anemias.	4			1		8.4	3	2				3.6
11. Describe a logical approach to diagnosing anemia.	2	2	1			8.2	4		1			3.6
12. Classify anemias on a morphologic basis and on a physiologic basis.	3		1			8.6	2	1	1			3.3
13. Discuss the qualitative and quantitative abnormalities of hemoglobin synthesis and their physiological implications--sickle cell disease, thalassemia syndromes, unstable hemoglobins, and variants with altered oxygen affinity.	3			1	1	7.6	3	1				3.8
14. Discuss the implications of abnormalities of red cell G-6 PD and PK deficiencies as models for abnormalities of glycolysis and oxidative metabolism.	2	3				8.4	2	1	2			3.0
15. Define polycythemia and differentiate the primary from the secondary form. Identify the physiologic bases of the secondary forms.	5					9.0	5					4.0
16. Discuss physiologic adaptations to anemia.	4		1			8.6	5					4.0
WHITE CELLS												
17. Recognize the maturation stages of white cell [illegible] correlate them with the functional compartments.	5					9.0	4	1				3.8
18. Define factors regulating production, release, and distribution of granulocytes (colony stimulating factor, leukocytosis inducing factor, endotoxin, epinephrine).	3	2				8.6	2	3				3.4
19. Discuss the role of granulocytes in phagocytosis and bacterial killing (phagocytosis, ingestion, functions of lysosomal and cytoplasmic enzymes), and explain defects of each function (chronic granulomatic disease, Chediak-Higashi syndrome, lazy-leukocyte syndrome).	5					9.0	3	1	1			3.4
20. Define neutropenia and describe the mechanisms and consequences.	4	1				8.8	5					4.0
21. Define and distinguish between the four major kinds of leukemia (AML, ALL, CML, CLL).	4		1			8.6	3		2			3.2

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	Mastery of Statement: How closely does this objective demonstrate the behavior which the student is expected to display in achieving the objective? 9	8	7	6	5	Centrality to UHSC Curriculum: How essential is it for every student in the program to achieve this objective? 4	3	2	1	0
22. Describe the myeloproliferative disorders and their interrelationships.	4		1			8.6	2	2	1	3.2
23. Describe the clinical presentations of the acute leukemias and discuss the differential diagnosis of leukemia.	4	1				8.8	1	4		3.2
24. Discuss the roles of chemotherapy, radiotherapy, and supportive care in the treatment of patients with the leukemias.	5					9.0		2	2 1	2.2
25. Describe the antagonists of chemotherapeutic agents and their mechanisms of action.	5					9.0	2	1	2	3.0
26. Describe the life cycle of human lymphocytes and explain the basis for the categorization into 2 subpopulations (B and T cells).	5					9.0	4	1		3.8
27. List the functions of B and T cells.	4		1			8.6	4		1	3.6
28 Describe the lymphoproliferative syndromes and distinguish their different effects on normal physiology (infectious mononucleosis, lymphoma, multiple myeloma, macroglobulinemia).	1	2	1	1		2.6	4	1		3.8
29. Recognize that there is a classification of lymphoproliferative disorders which has prognostic and therapeutic significance for patients.	2	1				7.8		1	1	2.5
30. Describe the life cycle of a monocyte and its physiologic role.	5					9.0	2	3		3.4
CLOTTING										
1. Describe the interactions of the clotting factors in the coagulation cascade. Identify the clotting factor act as a substrate, enzyme, co-factor, or initiating stimulus:.	4	1				8.8	5			4.0
2. Describe the interrelationships between fibrinolysis and coagulation.	4			1		8.4	4	1		3.8
3. Recognize the relationships of these two pathways to the complement and kinin cascades.	3	1				8.0		3	2	2.6
4. Compare and contrast reactions of the enzymes thrombin and plasmin with the substrate fibrinogen.	4		1			8.6	1	3	1	3.0
5. Discuss the synthesis of the vitamin K dependent clotting factors—including the effects of drugs and gastro-intestinal diseases.	4		1			8.6	4	1		3.8
6. Describe how the following tests are done and which clotting factors they reflect (prothrombin time, partial thromboplastin time, thrombin time, euglobulin clot lysis time).	4	1				8.8	3	1	1	3.4
7. Discuss the molecular basis , genetics, and clinical presentation of the following diseases: classical hemophilia (hemophilia A), Christmas disease, Von Willebrands's disease, the dysfibrinogenemias, diseases of vitamin K deficiency, and disseminated intravascular coagulation.	4	1				8.8	4	1		3.8
8. Describe how each of the following agents interrupts or modifies the hemostatic and coagulation sequences: heparin, warfarin, aspirin, dextran, streptokinase, epsilon aminocaproic acid, citrate. CITRIN	4	1				8.8	4	1		3.8
9. Draw a platelet and identify the three functional zones.	4		1			8.6	2	1	2	3.0
10. Describe the sequence of events in primary hemostatis and discuss the platelet release reaction.	5					9.0	4	1		3.8
11. Discuss the life cycle of the platelet.	5					9.0	3		2	3.2
12: Discuss how the following tests are done and which deficiencies they can identify: clot retraction, bleeding time, platelet aggregation, platelet factor 3 release.	4	1				8.8	3	1	2	3.0
13. Contrast thrombocytopenia caused by diseases of reduced platelet production with that caused by diseases of increased platelet production.	1	2	1	1		7.6	3	2		3.6
14. Discuss the physiologic basis, genetic and clinical presentation of the following diseases: Glanzmann's thrombasthenia, storage-pool disease, aspirin-like disorder.	5					9.0	4	1		3.8

-3-

Blood transfusion

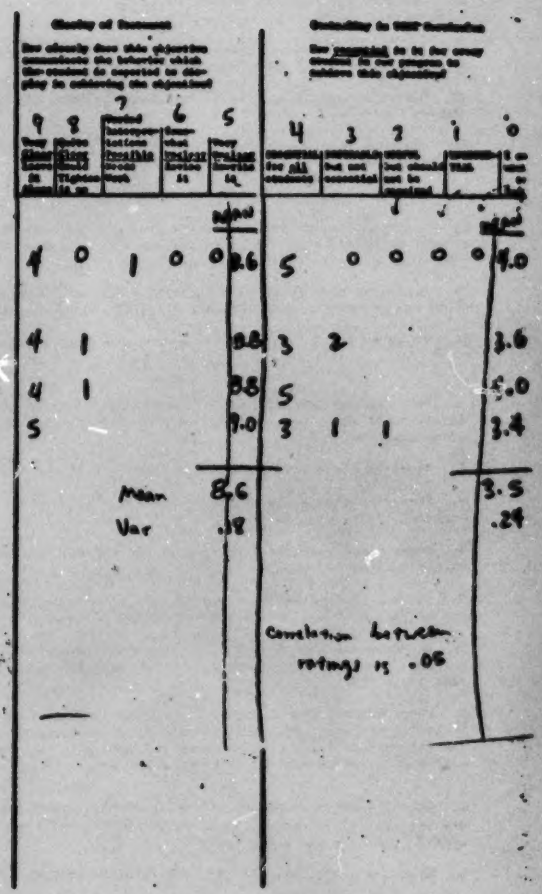
15. Contrast the ABO and Rh blood systems in terms of antibodies formed and the kinds of tests used to identify these antibodies.

16. Explain the process of blood typing and cross-matching and indicate why the following complications of blood transfusion are not prevented by these steps: hepatitis, febrile reactions, development of irregular isoantibodies, thrombocytopenia.

17. Identify the individual components of whole blood which can be separated for specific administration.

18. Discuss the complications of massive transfusion therapy.

Comments:



Comments for Hema. Subject Committee

1. cells (morphology?), including cycoplasmic inslusions(unimportant)
2. ~~for distinction~~ the
3. their limitations and utility

4. of red cells. and function ~~in~~ and how they act

10. for production - too general, therapy - diagnostic methods
11. describe stepwise
12. anemias either on a morphologic
13. qualitative and quantitative ?
14. discuss the implications significance of oxidative met or glug such as red cell G-6 PD and PK deficiencies --delete rest of sentence.

16. expand
17. place them properly

19. Discuss the role physology.....

22. ~~Delete~~ Delete sentence and use Describe the sequence of events in the leukocitic responses to acute and alvonic infection.-- ~~extended~~

28. give the major manifestation---28 and 29 are similar

Clotting

5. Discuss the synthesis - how much detail?

11. Ennumerate the steps and time periods in(delete Discuss) the....

15. in terms of antibodies -- conditions of production or classes of antibodies

Comments for Hema. Subject Committee

#28 - distinguish their difference effects on normal physiology- abnormalities associated with them

CLOTTING
#3 Recognize ? meaning

#1 - Microscopically identify ... major morphologic
#3 - their usefulness

#4 - in the life history (development, function and senescence)
11 - logical clinical ?
12 - (1)morphologic , (2)physiologic --there are correlative functinns of other objectives

14 - metabolism, and the effect x of these deficiencies on Red Cell survival and functi

CLOTTING
#9 - identify structure with function.

13 - platelet destruction

Blood trans.
#17 - administration, and list indications for administration of each.

Discuss the genetics, antegen structure,
a. and antibodies of the ABO blood group system.
xx Identify red cell antigens other than ABO, Rh, and discuss (b) modes of sensitizatio to these antigens.
c. Discuss leukocyte and platelet antigens and their importance to transfusion therapy.
D. discuss the pathophysiology, thereapy, and preventions of hemolytic diseasex of the new born.
e. Discuss the biochemistry, and physical chemistry of blood cell preservation with attention to effects of preservation on the recovery, survival, function of the transfused cell.
---apart from a &b, these are not currently emphasized in the hematolgoy curriculum -- suggest their consideration.

#1 - red cells on sample peripheral blood smears....major morphologic
2 - of normal red

4,- normal red cells.
18 - Define (Discuss)

CLOTTING
#8 - darvon arvin (ancrod)
12 - which deficiencies platelet abnormalities
13 - Discuss and contrast

Hematology

RED CELLS

1. Identify normal red cells on peripheral blood smears and characterize the major morphologic abnormalities, including cytoplasmic inclusions.

2. Describe the morphologic criteria that distinguish the normal stages of red blood cell development.

3. Define red cell indices and describe their use and limitations.

4. Discuss the roles of DNA, RNA, cytoplasmic enzymes, organelles and hemoglobin in the development and function of normal red cells.

5. Define the role of the following factors in control of blood cell production: erythropoietin, stem cells, hypoxia, and androgens.

6. Trace the fate of red blood cell breakdown products through their metabolic pathways.

7. Discuss the structure and function of hemoglobin, specifically including the oxygen dissociation curve, oxygen transport, and the effect of 2,3-DPG.

8. State a working definition of anemia, and discuss its physiologic implications.

9. Describe the three major types of anemia due to lack of nutrients or ineffective utilization of nutrients, including daily requirements, metabolism, means for identification of the anemias and their therapy (iron, vitamin B_{12}, folic acid)

10. Describe the mechanisms for production, approaches to diagnosis, and therapy for hemolytic anemias.

11. Describe a stepwise clinical approach to diagnosing anemia and recognize the differences between Classifications.

12. Discuss the nature of the defect of hemoglobin synthesis and physiological implications in sickle cell disease, thalassemic syndromes, the unstable hemaglobins, and variants with altered oxygen affinity.

13. Discuss the role of glycolysis and oxidative metabolism in red cells. Describe the effects on cell function and survival of G-6-PD and PK deficiencies.

14. Define polycythemia and differentiate the primary from the secondary form. Identify the physiologic bases of the secondary forms.

15. Discuss the potential physiologic adaptations to tissue hypoxia.

WHITE CELLS

16. Recognize the maturation stages of granulocyte development and correlate them with the functional compartments.

17. Discuss the mechanisms by which the following factors regulate granulocyte production, release, and distribution: colony stimulating factor, leukocytosis inducing factor, endotoxin, epinephrine.

physiologic

19. Discuss the role of granulocytes in phagocytosis and bacterial killing (chemotaxis, ingestion, functions of lysosomal and cytoplasmic enzymes), and explain defects of each function (chronic granulomatis disease, Chediak-Higashi syndrome, lazy-leukocyte syndrome).

19. Define neutropenia and describe its mechanisms and consequences.

20 Define and distinguish [redacted] the four major kinds of leukemia (AML, ALL, CGL, CLL).

21. Describe the myeloproliferative disorders and their interrelationships.

22. Describe the clinical presentations of the acute leukemias and discuss the differential diagnosis of leukemia.

~~24. Discuss the role of chemotherapy, radiotherapy, and surgery in the treatment of patients with the leukemias.~~

discuss

23. Describe the categories of chemotherapeutic agents and their mechanisms of action.

24. Describe the life cycle of human lymphocytes and explain the basis for the categorization into 2 subpopulations (B and T cell).

25. List the functions of B and T cells.

Characteristic manifestations of the following lymphoid diseases: X

26 Describe the [redacted] and distinguish their different effects on normal physiology (infectious mononucleosis, lymphoma, multiple myeloma, macroglobulinemia).

~~27. Recognize that there is a classification of lymphoproliferative disorders which has prognostic and therapeutic significance for patients.~~

28. Describe the life cycle of a monocyte and its physiologic role.

~~CLOTTING~~ Hemostasis and Coagulation

29. Describe the interactions of the clotting factors in the coagulation cascade. Identify which clotting factor(s) act as a substrate, enzyme, cofactor, or initiator, stimulus.

30. Describe the interrelationships between fibrinolysis and coagulation.

~~31. Recognize the relationships of these two pathways to the complement and kinin cascades.~~

30 Compare and contrast reactions of the enzymes thrombin and plasmin with the substrate fibrinogen.

31. Discuss the synthesis of the vitamin K dependent clotting factors--including the effects of drugs and gastro-intestinal diseases.

32. Describe how the following tests are done and which clotting factors they reflect (prothrombin time, partial thromboplastin time, thrombin time, euglobulin clot lysis time).

33. Discuss the molecular basis, genetics, and clinical presentation of the following diseases: classical hemophilia (hemophilia A), Christmas disease, Von Willebrands's disease, the dysfibrinogenemias, diseases of vitamin K deficiency, and disseminated intravascular coagulation.

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34. Describe how each of the following agents interrupts or modifies the hemostatis and coagulation sequences: heparin, warfarin, aspirin, ~~dextran~~ arvin, streptokinase, epsilon-aminocaproic acid, citrate.

~~35. Draw a platelet and identify the three functional zones.~~

35. Describe the sequence of events in primary hemostatis and discuss the platelet release reaction.

36. Describe the life cycle of the platelet.

37. Describe how the following tests are done and which platelet abnormalities they can identify: clot retraction, bleeding time, platelet aggregation, platelet factor 3 release.

38. Discuss and contrast thrombocytopenia caused by diseases of reduced platelet production with that caused by diseases of increased platelet destruction.

39. Discuss the physiologic basis, genetic and clinical presentation of the following diseases: Glanzmann's thrombasthenia, storage-pool disease, aspirin-like disorder.

Blood transfusion

40. Contrast the ABO and Rh blood systems in respect to genetics, antigen structure, classes of antibodies formed, the usual conditions for their formation, and the kinds of tests used to identify these antibodies.

41. Explain the process of blood typing and cross-matching and indicate why the follwing complications of blood transfusion are not prevented by these steps: hepatitis, fibrile reactions, development of irregular isoantibodies, thrombocytopenia.

42. Identify the individual components of whole blood which can be separated for specific administration and list the indications for use of each component.

43. Discuss the complications of massive transfusion therapy.

44. Discuss the pathophysiology, therapy and prevention of hemolytic disease of the newborn.

9. Discuss the three major types of anemia due to lack of nutrients or their ineffective utilization (iron, vitamin B_{12}, folic acid). Describe the daily requirements and metabolism for each nutrient and indicate the means for identifying the anemias and their therapies.

10. Describe the different ways in which hemolytic anemias are caused by cellular and extracellular abnormalities, the methods available for their diagnosis, and their therapies.

University of Connecticut Health Center
Committee on the Curriculum

Subject Committee Chairman: L. Hoyer
Curriculum Chairman: Craig L. Gjerde

HEMATOLOGY

EDUCATIONAL OBJECTIVES

RED CELLS

1. Identify normal red cells on peripheral blood smears and characterize the major morphologic abnormalities, including cytoplasmic inclusions.

2. Describe the morphologic criteria that distinguish the stages of normal red blood cell development.

3. Define red cell indices and describe their use and limitations.

4. Discuss the roles of DNA, RNA, cytoplasmic enzymes, organelles and hemoglobin in the development and function of normal red cells.

5. Define the role of the following factors in control of blood cell production: erythropoietin, stem cells, hypoxia, and androgens.

6. Trace the fate of red blood cell breakdown products through their metabolic pathways.

7. Discuss the structure and function of hemoglobin, specifically including the oxygen dissociation curve, oxygen transport and the effect of 2,3-DPG.

8. State a working definition of anemia, and discuss its physiologic implications.

9. Discuss the three major types of anemia due to lack of nutrients or their ineffective utilization (iron, vitamin B_{12}, folic acid). Describe the daily requirements and metabolism for each nutrient and indicate the means for identifying the anemias and their therapies.

10. Describe the different ways in which hemolytic anemias are caused by cellular and extracellular abnormalities, the methods available for their diagnosis, and their therapies.

11. Describe a stepwise clinical approach to diagnosis of anemias and recognize the difference between morphologic and physiologic classifications.

12. Discuss the nature of the defect of hemoglobin synthesis and their physiological implications in sickle cell disease, the thalassemic syndromes, the unstable hemoglobins, and hemoglobin variants with altered oxygen affinity.

13. Discuss the role of glycolysis and oxidative metabolism in red cells. Describe the effects on red cell function and survival of G-6-PD and PK deficiencies.

14. Define polycythemia and differentiate the primary from the secondary form. Identify the physiologic bases of the secondary forms.

15. Discuss the potential physiologic adaptations to tissue hypoxia.

WHITE CELLS

16. Recognize the maturation stages of granulocyte development and correlate them with the functional compartments.

17. Discuss the mechanisms by which the following factors regulate granulocyte production, release, and distribution: colony stimulating factor, leukocytosis inducing factor, endotoxin, and epinephrine.

18. Discuss the physiologic role of granulocytes in phagocytosis and bacterial killing (e.g., chemotaxis, ingestion, functions of lysosomal and cytoplasmic enzymes), and explain defects of each function (e.g., chronic granulomatous disease, Chediak-Higashi syndrome, lazy-leukocyte syndrome).

19. Define neutropenia and describe its mechanisms and consequences.

20. Define and distinguish the four major kinds of leukemia (AML, ALL, CGL, CLL).

21. Describe the myeloproliferative disorders and their interrelationships.

22. Describe the clinical presentations of the acute leukemias and discuss the differential diagnosis of these leukemias.

23. Describe the categories of chemotherapeutic agents and discuss their mechanisms of action.

24. Describe the life cycle of human lymphocytes and explain the basis for the categorization into 2 subpopulations (B and T cell).

25. List the functions of B and T cells.

26. Describe the characteristic manifestations of the following lymphoid diseases: infectious mononucleosis, the lymphomas, multiple myeloma, macroglobulinemia. Distinguish their different effects on normal physiology.

HEMOSTATSIS AND COAGULATIONS

27. Describe the interactions of the clotting factors in the coagulation cascade. Identify those clotting factors which act as substrates, enzymes, co-factors, or initiators.

28. Describe the interrelationships between fibrinolysis and coagulation.

29. Compare and contrast reactions of the enzymes thrombin and plasmin with the substrate fibrinogen.

30. Discuss the synthesis of the vitamin K dependent clotting factors--including the effects of drugs and gastrointestinal diseases.

31. Describe how the following tests are done and which clotting factors they reflect (prothrombin time, partial thromboplastin time, thrombin time, euglobulin clot lysis time).

32. Discuss the molecular basis, genetics, and clinical presentation of the following diseases: classical hemophilia (hemophilia A), Christmas disease, Von Willebrands's disease, the dysfibrinogenemias, diseases of vitamin K deficiency, and disseminated intervascular coagulation.

33. Describe how each of the following agents interrupts or modifies the hemostatis and coagulation sequences: heparin, warfarin, aspirin, arvin, streptokinase, epsilin-aminocaproic acid, citrate.

34. Describe the sequence of events in primary hemostatis and discuss the platelet release reaction.

35. Describe the life cycle of the platelet.

36. Describe how the following tests are done and which platelet abnormalities they can identify: clot retraction, bleeding time, platelet aggregation, platelet factor 3 release.

37. Discuss and contrast thrombocytopenia caused by diseases of reduced platelet production with that caused by diseases in which there is increased platelet destruction.

38. Discuss the physiologic basis, genetics and clinical presentation of the following diseases: Glanzmann's thrombasthenia, storage-pool disease, the aspirin-like disorder.

BLOOD TRANSFUSION

39. Contrast the ABO and Rh blood systems in respect to genetics, antigen structure, classes of antibodies formed, the usual conditions for their formation, and the kinds of tests used to identify these antibodies.

40. Discuss the pathophysiology, therapy and prevention of hemolytic disease of the newborn.

41. Explain the process of blood typing and cross-matching and indicate why the following complications of blood transfusion are not prevented by these steps: hepatitis, febrile reactions, development of irregular isoantibodies, thrombocytopenia.

42. Identify the individual components of whole blood which can be separated for specific administration and list the indications for use of each component.

43. Discuss the complications of massive transfusion therapy.

APPENDIX E

An example of the revisions in objectives of the Growth and Development subject committee which occured during their development.

E1 - The first draft, May 16, 1974

E2 - The second draft, May 20, 1974

E3 - The rating by nine people, December 4, 1974

E4 - The subsequent revision based on the ratings, March 8, 1975

EDUCATIONAL OBJECTIVES Appendix E1

First Draft (Werloff)

I. GENETICS AND EMBRYOLOGY

A. Genetics - (Normal)

Objectives

1. Explain and define polygenic inheritance with respect to: (a) multiple alleles; (b) quantitative traits; (c) continuous variations; (d) multi-factorial inheritance.

2. Explain how genetic factors are influenced by environmental and experiential events.

3. Given a known polygenic trait or disease distinguish its inheritance pattern from that of one under single control; i.e., dominant or recessive pattern.

4. Explain the manner in which twin studies may be used to distinguish between genetic and environmental factors in normal or abnormal traits.

5. Explain the "threshold hypothesis" for the appearance of a deleterious trait in relationship to the general population incidence of that trait.

6. Explain the interaction of genetic and environmental factors in the production of a given polygenetic trait such as congenital dislocated hip with respect to: (a) twin studies; (b) familial occurrence; (c) sex defect; (d) ethenic or cultural factors.

. Genetics - (Abnormal)

Objectives

1a. Recognize that fetal wastage and congenital malformation lie on a continuum of reproductive casualities which are tied to environmental and genetic factors.

1b. List the incidence of major kinds of malformation, and their relation to genetic and environmental factors.

2. List the conditions under which one performs genetic counselling.

3. List the techniques used in determining whether there is malformation; e.g., amniocentesis.

4. Discuss the pros and cons of genetic counselling in regard to abortion, with respect t. the family, the individual fetus,and society.

5. Define the term: 'small for date' versus 'true premature'.

6. Distinguish between fetal, maternal and placental effects in 'small-for-date'babies.

7. Describe the impact of societal and environmental factors in low birth weight babies.

8. Identify the relationships between cell and organ growth, and protein synthesis in selected organs; e.g., the brain.

9. Describe the ways one can ameliorate growth defects (stimulation, nutrition, maternal care).

10. Describe growth defects which can be reversed.

B. Embryology - (Normal)

Objectives

1. Describe mechanisms and principles (with appropriate examples) of the normal fetal development; e.g., fertilization, cleavage, gastrolation, induction, (and kollar.)

2. Describe the origins of cell specificity and cell migration.

3. Evaluate the interaction between environmental and genetic factors in organogenesis.

Embryology - (Abnormal)

Objectives

1. Identify the major determinants of attitudes toward abortion and population control in the general public and among health professionals.

2. Distinguish the characteristics among parents that lead to the unwanted child.

3. Identify the consequences of unwantedness for the child.

4. Distinguish the psychiatric and social indications for therapeutic abortions.

5. Identify the changes in the legal status of abortion in this generation.

II. GROWTH

A. Normal

Objectives

1. Describe the factors that control growth at the cellular, organ, and whole organism level.

2. Describe the potential reversibility of these growth changes. (Hintz to develop)

3. Explain how measuring the growth of a child relative to normal standards is an important index of health.

4. Discuss the various measures of physiological maturity and relationships among them.

5. Describe the differential growth of tissues at adolescence.

6. Discuss the sequence of developmental events during puberty.

B. Abnormal

1. Describe some of the general causes of growth failure, their manifestations, and tests for them.

2. Evaluate the impact of biological and psychosocial stimulation on the causes of growth failure.

3. Describe the effects of the following environmental factors on growth and development: nutrition, lead, infection, pollution, population.

4. Formulate a plan for the evaluation and treatment of a child from the ghetto who is showing growth retardation; determine the relative weighting of various environmental facts in your evaluation.

III. NEO-NATE

A. Psychosocial

Objectives

1. Describe the reciprocal interactions between mother and infant.

2. Evaluate the importance of early social attachment on the subsequent behavior of the individual. (See Wintrob on Wednesday)

B. Physiology (ask John Raye for more info)

Objectives

1. Describe the adjustments of the newborn.

2. List some representative reflexes that are present at birth and those that are postnatally acquired. List the age at which they occur.

3. Assess the presence or absence of infantile reflex as a means of determining the neurological status of the infant.

4. Describe the level of CNS maturation that is necessary to provide the basis for the functional maturation of reflexes.

5. Describe the oral cavity of the newborn.

6. Discuss the sequence of tooth eruption.

7. Evaluate the interaction between environmental and biological events related to defects in tooth structure and dental carries.

8. Describe the major landmarks in the growth of the jaws and face.

First Draft
(Warhoff)

IV. PRE-SCHOOL

A. Normal

Objectives

1. Describe and assess the developmental status of pre-school children in these areas of functioning: (a) gross motor; (b) fine motor-adaptative; (c) language; (d) personal-social.

2. Discuss the concept of "developmental lag" found within a given child in relation to uneven levels of maturation in the above functions.

3. Become familiar with the Denver Developmental Reading Test as one resource that can be utilized in assessing a young child's developmental level or as a general reference for highlighting norms for a given area of development.

4. Consider similarities and differences between children of the same and different ages.

5. Consider factors in the interaction between the child and his environment that affect the child's development.

6. Become aware of characteristics of an individual child's "style"; i.e., his motive dealing with his environment, and discuss aspects of the child's apparent "style" that may be characteristic of the individual and/or age dependent.

7. Describe the changes that take place in cognitive functioning from birth to adolesence.

8. Discuss the impact of experiential and environmental events on the child's cognitive function.

9. Discuss the impact of enriched or deprived environment on cognitive development.

10. Evaluate the use of the IQ test as an assessment device.

11. Describe the stages in the development of speech and language.

B. Abnormal

Objectives

1. Compare and contrast the relative merits of viewing learning disabilities from either a medical or psychoeducational viewpoint.

2. Discuss the relative contribution of medicine and psychoeducation to methods for diagnosis and treatment(of children with learning disabilities).

3. Discuss the interaction between biological and psychosocial factors in mental retardation both from an ideological view as well as from a management view.

V. ADOLESCENCE

Objectives

1. Describe the changes (physical, endocrinological,psychosocial) which take place in puberty.

2. For a given individual, determine the interrelationship between the physical, endocrinological, and psychosocial factors; for example, describe how slow physical growth might affect psychosocial development.

3. Distinguish the components of normal adolescent identity formation.

4. Identify the contribution to identity formation in early, middle, and late adolescence.

5. Identify the major sources of identity conflict.

6. Synthesize your knowledge - biological, social, psychological components of physical illness in adolescence in formulating a plan to evaluate and treat a adolescent with a physical illness; for example, diabetes, drug addiction, vd, etc.

VI. MIDDLE YEARS

Objectives

1. Identify the principal biological, psychosocial, and social components of normal adjustment in the middle years.

2. Identify the major phiosiological changes of the middle years; e.g., endocrine, musculo-skeletal changes.

3. Identify the significance of the relationship between physical changes in the middle years and the development of body image.

4. Integrate the biological changes and body-image changes.

5. Identify the effects of biological and body-image changes in terms of psychological adjustments; e.g., suicide, depression.

6. Identify the biological, social and phychological components of the illness in the middle years; e.g., heart disease, obesity.

7. Identify the social and psychological components of the illness in the middle years; e.g., sexuality, depression.

8. Based on your general knowledge of the middle years, analyze the health psychological adaptation and family integration of health professions.

9. Apply the concept of psychosocial development in the middle years to the determination of your own personal,professional, and family life.

VII. AGING

Objectives

1. Identify the principal, biological, psychosocial, and social components of normal adjustment in the aging.

2. Describe biological, and psychosocial changes that occur with aging.

3. Determine your own attitude as a health professional toward older people (aging, semantic differential) and elucidate the origins of these attitudes.

4. Discuss some of the ways in which these attitudes towards the aging effect delivery of care.

5. Compare and contrast the political and economic factors involved in providing health care to the aging.

6. Given that aging involves deterioration, debilitation, and alienation synthesize your knowledge and apply it to a patient with multiple disabilities.

7. Analyze your own feelings about the reaction to loss and aging.

VIII. DEATH & DYING

Objectives

1. Analyze one's own feelings about the process of death.

2a. Develop attitudes and skills relative to the management of dying patients and their families.

2b. Recognize the functional limitations of denial and protest in the management of the dying patient.

3. Evaluate the impact of the death of a child on the family.

4. Apply the information relative to developmental status of a dying patient to that patient and his family; e.g., a child of three dying of leukemia as opposed to a child of 14 or 36.

GROWTH & DEVELOPMENT SUBJECT COMMITTEE

Appendix E2

EDUCATIONAL OBJECTIVES

I. GENETICS AND EMBRYOLOGY

A. Genetics - Normal

OBJECTIVES

1. Explain and define polygenic inheritance with respect to: (a) multiple alleles; (b) quantitative traits; (c) continuous variations; (d) multi-factorial inheritance.

2. Restate the genetic classification of disease with regard to single gene, polygenic, and chromosomal disorders.

3. Given a known polygenic trait or disease, distinguish its inheritance pattern from that of one under single control; e.g., dominant or recessive pattern.

4. Explain the manner in which twin studies may be used to identify genetic factors in the investigation of normal or abnormal traits.

5. Explain the "threshold hypothesis" for the occurence of a deleterious trait in a family and its relationship to the general population incidence of that trait.

6. Explain the interaction of genetic and environmental factors in the production of a given polygentic trait such as congenital dislocated hip with respect to: (a) twin studies; (b) familial occurrence; (c) sex defect; (d) ethnic or cultural factors.

Genetics - Abnormal

OBJECTIVES

1. Classify, characterize, and give the general incidence of these birth defects: genetic diseases; chromosomal abnormalities; structural abnormalities; and mental retardation.

2. For each of these four major types of birth defects, give appropriate examples which typify that category with regard to description, etiology, pathogenesis, occurence risk, and epidemiology.

3. Given a family in which a birth defect has occurred, describe the information necessary and the conditions under which one performs genetic counselling.

4. Given a genetic counselling situation, identify the major ethical, moral, religious, and social issues which may stem from that interaction.

B. Embryology - Normal

OBJECTIVES

1. Describe mechanisms and principles (with appropriate examples) of the normal fetal development; e.g., (a) fertilication, (b) cleavage, (c) gastrolation, (d) induction. (Kollar)

2. Describe the origins of cell specificity and cell migration.

3. Evaluate the interaction between environmental and genetic factors in organogenesis.

4. Describe the fetal development of the immune system (humoral, cellular) and its relationship to post-natal life.

Embryology - Abnormal

OBJECTIVES

1. Identify the major attitudes toward theraputic abortion and family planning in the general public and among health professionals.

2. Identify the many factors (e.g., personality, social role, economic status, family size) found among parents that lead to the unwanted child.

3. Identify the consequences for the child of being unwanted.

4. State the principle components of Connecticut's abortion law.

II. GROWTH

A. Normal - OBJECTIVES

1. Describe the interplay of the genetic, humoral and nutritional factors in the control of growth at the cellular, organ, and whole organism level.

2. Differentiate between hyperplasia and hypertrophy when describing cell and organ growth.

3. Distinguish between total organism growth and individual organ differentiation (e.g., the brain).

4. Describe the manner in which longitudinal and cross-sectional population growth curves are constructed.

5. Illustrate the manner in which growth curves are used in the evaluation of human growth.

6. Assess the major measures of developmental maturity (e.g., bone age, height age, dental age, weight age, head circumference) with regard to their ability to serve as indicators of normal growth.

7. Discuss the sequence of developmental events, the range of normal age of occurence, and the control mechanisms for the adolescent growth-sprout.

B. Abnormal - OBJECTIVES

1. Classify any given growth problem into one of the six categories: inadequate intake; failure to assimilate; increased metabolism; failure to utilize; failure of stimulation; and organ resistance.

2. Define and distinguish among birthweight, gestational maturity, and chronological age.

3. Distinguish between small for gestational age, appropriate for gestational age, large for gestational age, true prematurity, and low birthweight infant.

4. Given a child who is small-for-dates, determine the fetal, maternal, and placental factors which may have contributed to the etiology.

5. List 10 significant epidemiologic factors which contribute to the incidence of low birth weight babies.

6. Describe the impact of a low birth weight baby on the family, society, and the development of the baby.

7. Suggest methods for prevention of growth abnormalities such as small-for-gestation-age, and maternal deprivation syndrome.

8. Discuss the maternal deprivation syndrome as a model to the interaction of biological and psychosocial stimulation on the causes of growth failure.

9. Describe the adverse effects of the following environmental factors on growth and development: malnutrition, lead, infection, pollution, overcrowding.

10. State the information you would require in evaluating a child from the ghetto who is showing growth retardation; justify the potential relevancy of the information you seek.

III. NEO-NATE

A. Psychosocial - OBJECTIVES

1. Discuss the theories of early social attachment (developed from animal and human experiments) as background for the subsequent behavior of the individual.

2. Describe the major elements of the maternal-infant relationship and assess their significance to later development and behavior.

B. Physiological - OBJECTIVES

1. Describe the physiologic and biologic adjustments of the newborn (cardio-vascular, respiratory, carbohydrate metabolism, thermal control, bilirubin metabolism) to the extra-uterine environment.

2. List the major development reflexes of the infant and the sequence of their acquisition and disappearance.

3. Assess the presence or absence of infantile reflex as a means of determining the neurological status and maturity of the infant.

4. Describe the relationship between the level of CNS maturation and the anatomical development of the brain.

5. Describe the structure and formation of the face and oral cavity.

6. Discuss the developmental sequence of tooth eruption in relationship to growth of the infant.

7. Differentiate between environmental and biological factors in the production of dental caries, malocclusion, and defects in tooth structure.

IV. PRE-SCHOOL

A. Normal

Objectives

1. Describe and assess the developmental status of pre-school children in these areas of functioning: (a) gross motor; (b) fine motor-adaptative; (c) language; (d) personal-social.

2. Discuss the concept of "developmental lag" found within a given child in relation to uneven levels of maturation in the above functions.

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4. Consider similarities and differences between children of the same and different ages.

5. Consider factors in the interaction between the child and his environment that affect the child's development.

6. Become aware of characteristics of an individual child's "style"; i.e., his motive dealing with his environment, and discuss aspects of the child's apparent "style" that may be characteristic of the individual and/or age dependent.

7. Describe the changes that take place in cognitive functioning from birth to adolesence.

8. Discuss the impact of experiential and environmental events on the child's cognitive function.

9. Discuss the impact of enriched or deprived environment on cognitive development.

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Objectives

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3. Identify the significance of the relationship between physical changes in the middle years and the development of body image.

4. Integrate the biological changes and body-image changes.

5. Identify the effects of biological and body-image changes in terms of psychological adjustments; e.g., suicide, depression.

6. Identify the biological, social and phychological components of the illness in the middle years; e.g., heart disease, obesity.

7. Identify the social and psychological components of the illness in the middle years; e.g., sexuality, depression.

8. Based on your general knowledge of the middle years, analyze the health psychological adaptation and family integration of health professions.

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2. Describe biological, and psychosocial changes that occur with aging.

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4. Discuss some of the ways in which these attitudes towards the aging effect delivery of care.

5. Compare and contrast the political and economic factors involved in providing health care to the aging.

6. Given that aging involves deterioration, debilitation, and alienation synthesize your knowledge and apply it to a patient with multiple disabilities.

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VIII. DEATH & DYING

Objectives

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2b. Recognize the functional limitations of denial and protest in the management of the dying patient.

3. Evaluate the impact of the death of a child on the family.

4. Apply the information relative to developmental status of a dying patient to that patient and his family; e.g., a child of three dying of leukemia as opposed to a child of 14 or 36.

THE UNIVERSITY OF CONNECTICUT
HEALTH CENTER

4 December, 1974

Here are the ratings of the objectives of the Graduate Development committee. 9 persons rated the objectives as to their clarity and centrality according to the following scales:

Clarity of Statement: How clearly does this objective communicate the behavior which the student is expected to display in achieving the objective?					Centrality in UCHC Curriculum: How essential is it for every student in our program to achieve this objective?				
Very Clear Leave it Alone	Quite Clear Could Tighten it up	Varied Interpretations Possible Needs Work	Somewhat Unclear Revise it	Very Unclear Rewrite it	ESSENTIAL for all students	DESIRABLE but not essential	USEFUL but should not be required	UNESSENTIAL	I am unable to judge
9	8	7	6	5	4	3	2	1	0

You may wish to consider the comments of the raters and their ratings of clarity and centrality in developing the list of objectives which you wish to communicate to the faculty as the Educational Objectives of your committee.

Some schools use a centrality rating of (3.3) as the cutting point for exclusion of an objective and the clarity rating of (8.3) as the cutting point for revision of the wording; you, however, will be the final judge.

I would like to meet with you as you consider these data and develop your "final" list of objectives. (I recognize that the objectives of the course will and should change over time).

Craig Gjerde
ext. 2118
B-5058

FARMINGTON, CONNECTICUT 06032

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RATINGS OF OBJECTIVES

Instructions: After you read each objective, rate its clarity and its centrality. Feel free to revise any objective and to suggest additional objectives.

Name (optional) _____

Date: Dec 4, 1974

9 raters

* = questionable

GROWTH & DEVELOPMENT SUBJECT COMMITTEE

EDUCATIONAL OBJECTIVES

	Clarity of Statement: How clearly does this objective communicate the behavior which the student is expected to display when achieving the objective? (Very clear; Quite clear; Partial interpretations possible; Somewhat unclear; Very unclear)	Centrality to MMC Curriculum: How essential is it for every student in our program to achieve this objective? (Essential for all students; Optional, but not essential; Useful, but should not be required; Unsure; I am unable to judge)
I. GENETICS AND CYTOLOGY		
A. Genetics - Normal		
OBJECTIVES		
1. Explain and define polygenic inheritance with respect to: (a) multiple alleles; (b) quantitative traits; (c) continuous variations; (d) multi-factorial inheritance.	Tallies 6 2 / 9 8 7 6 5 (8.75)	4 3 2 1 0 (3.5)
2. Restate the genetic classification of disease with regard to single gene, polygenic, and chromosomal disorders.	2 1 4 1 / 9 8 7 6 5 *(7.5)	3 3 1 / 4 3 2 1 0 *(3.2)
3. Given a known polygenic trait or disease, distinguish its inheritance pattern from that of one under single control; e.g., dominant or recessive pattern.	7 1 / 9 8 7 6 5 (8.8)	6 1 / 4 3 2 1 0 (3.2)
4. Explain the manner in which twin studies may be used to identify genetic factors in the investigation of normal or abnormal traits.	7 2 / 9 8 7 6 5 (8.5)	2 5 1 / 4 3 2 1 0 (3.1)
5. Explain the "threshold hypothesis" for the occurrence of a deleterious trait in a family and its relationship to the general population incidence of that trait.	4 3 1 / 9 8 7 6 5 (8.3)	1 2 / 4 3 2 1 0 (3.6)
6. Explain the interaction of genetic and environmental factors in the production of a given polygenic trait such as congenital dislocated hip with respect to: (a) twin studies; (b) familial occurrence; (c) sex defect; (d) ethnic or cultural factors.	5 2 2 / 9 8 7 6 5 (8.3)	5 3 / 4 3 2 1 0 (3.6)
B. Genetics - Abnormal		
OBJECTIVES		
1. Classify, characterize, and give the general incidence of these birth defects: genetic diseases; chromosomal abnormalities; structural abnormalities; and mental retardation.	4 3 2 / 9 8 7 6 5 *(8.2)	8 1 / 4 3 2 1 0 (3.9)
2. For each of these four major types of birth defects, give appropriate examples which typify that category with regard to description, etiology, pathogenesis, recurrence risk, and epidemiology.	6 2 1 / 9 8 7 6 5 *(8.2)	5 3 / 4 3 2 1 0 (3.6)
3. Given a family in which a birth defect has occurred, describe the information necessary and the conditions under which one performs genetic counselling.	5 2 2 / 9 8 7 6 5 (8.3)	4 4 1 / 4 3 2 1 0 (3.3)
4. Given a genetic counselling situation, identify the major ethical, moral, religious, and social issues which may stem from that interaction.	5 2 2 / 9 8 7 6 5 (8.3)	4 4 1 / 4 3 2 1 0 (3.3)
C. Embryology - Normal		
OBJECTIVES		
1. Describe mechanisms and principles (with appropriate examples) of the normal fetal development; e.g., (a) fertilization, (b) cleavage, (c) gastrulation, (d) induction.	1 / 9 8 7 6 5 (8.4)	5 2 1 / 4 3 2 1 0 (3.5)
2. Describe the origins of cell specificity and cell migration.	4 3 1 / 9 8 7 6 5 (8.4)	1 3 1 / 4 3 2 1 0 (3.4)
3. Evaluate the interaction between environmental and genetic factors in [illegible]	*(7.6) 3 2 1 1 1	2 4 1 *(3.1)

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	Clarity of Statement: How clearly does this objective communicate the behavior which the student is expected to display in achieving the objective?					Centrality to UCHC Curriculum: How essential is it for every student in our program to achieve this objective?				
	Very Clear; Leaves No Alternative	Quite Clear; Could Tighten It up	Invited Interpretations Possible; Needs Work	Somewhat Unclear; Revise It	Very Unclear; Rewrite It	ESSENTIAL for all students	DESIRABLE but not essential	UTILITY but should not be required	UNDESIRABLE	
4. Describe the fetal development of the immune system (humoral, cellular) and its relationship to post-natal life.	5 3 9 8		7	(5.6) 6 5		5 4	1 3	1 2	(3.6) 1	0
Embryology - Abnormal										
OBJECTIVES										
1. Identify the major attitudes toward therapeutic abortion and family planning in the general public and among health professionals.	7 9 8		2 7	(8.6) 6 5		3 4	3 3	3 2	(3.0) 1	0
2. Identify the many factors (e.g., personality, social role, economic status, family size) found among parents that lead to the unwanted child.	6 1 9 8		~ 7	(8.4) 6 5		4 4	3 3	2	(3.4) 1	0
3. Identify the consequences for the child of being unwanted.	9 6 8 2 9 6 8 1		1 7	8.6 6 5		4 6 4	3 3 3	2	(3.7) 1	
4. State the principle components of Connecticut's abortion law.	9 6 8 1 9 8		7	(8.9) 6 5		5 4 4	3 3	1 2 2	(3.4) 1	
II. GROWTH										
A. Normal - OBJECTIVES										
1. Describe the interplay of the genetic, humoral and nutritional factors in the control of growth at the cellular, organ, and whole organism level.	5 9 8		3 7	(8.4) 6 5		7 4	2 3	2	(3.8) 1	
2. Differentiate between hyperplasia and hypertrophy when describing cell and organ growth.	7 1 9 8		7	(8.8) 6 5		7 4	1 3	2	(3.9) 1	0
3. Distinguish between total organism growth and individual organ differentiation (e.g., the brain).	5 2 9 8		1 7	(8.5) 6 5		7 4	1 3	2	(3.9) 1	
4. Describe the manner in which longitudinal and cross-sectional population growth curves are constructed.	6 1 9 8		1 7	(8.6) 6 5		3 4	4 3	1 2	3.3 1	
5. Illustrate the manner in which growth curves are used in the evaluation of human growth.	7 9 8		2 7	(8.6) 6 5		8 4	1 3	2	(3.9) 1	0
6. Assess the major measures of developmental maturity (e.g., bone age, height age, dental age, weight age, head circumference) with regard to their ability to serve as indicators of normal growth.	8 1 9 8		7	(8.9) 6 5		5 4	1 3	2	(3.9) 1	0
7. Discuss the sequence of developmental events, the range of normal age of occurrence, and the control mechanisms for the adolescent growth-sprout.	3 9 8	3	7	(8.3) 6 5		9 4	3	2	(4.0) 1	
B. Abnormal - OBJECTIVES										
1. Classify any given growth problem into one of the six categories: inadequate intake; failure to assimilate; increased metabolism; failure to utilize; failure of stimulation; and organ resistance.	5 3 9 8		1 7	(8.1) 6 5		7 4	1 3	2	(3.8) 1	0
2. Define and distinguish among birthweight, gestational maturity, and chronological age.	8 9 8		1 7	(8.8) 6 5		8 4	1 3	2	(3.9) 1	0
3. Distinguish between small for gestational age, appropriate for gestational age, large for gestational age, true prematurity, and low birthweight infant.	9 9 8		7	9.0 6 5		4	3	2	4.0 1	0
4. Given a child who is small-for-dates, determine the fetal, maternal, and placental factors which may have contributed to the etiology.	6 3 9 8		7	(8.7) 6 5		6 4	2 3	1 2	(3.6) 1	0

	Clarity of Statement: How clearly does this objective communicate the behavior which the student is expected to display in achieving the objective?					Centrality in WSHS Curriculum: How essential is it for every student in our program to achieve this objective?				
	Very Clear; Leaves no doubt	Quite Clear; Could Tighten it up	Varied Interpretations Possible; Needs Work	Somewhat Unclear; Revision Needed	Very Unclear; Rewrite It	ESSENTIAL for all students	IMPORTANT, but not essential	USEFUL, but should not be required	UNNECESSARY	I don't understand it
(5.) List 10 significant epidemiologic factors which contribute to the incidence of low birth weight babies.	7 1 9 8	1 7	6	(7.7) 5		3 4	2 3	2	* 1	0
(6.) Describe the impact of a low birth weight baby on the family, society, and the development of the baby.	3 2 9 8	3 7	1 6	*(7.8) 5		2 4	5 3	2	* 1	3.0 0
(7.) Suggest methods for prevention of growth abnormalities such as small-for-gestation-age, and maternal deprivation syndrome.	4 1 9 8	3 7	1 6	*(7.9) 5		4	3	2	* 1	2.0 0
8. Discuss the maternal deprivation syndrome as a model to the interaction of biological and psychosocial stimulation on the causes of growth failure.	5 3 9 8	1 7		(8.4) 5		4	3	1 2	1	3.3 0
9. Describe the adverse effects of the following environmental factors on growth and development: malnutrition, lead, infection, pollution, overcrowding.	7 9 8	2 7	6	(8.6) 5		5 4	3	2	1	3.6 0
10.) State the information you would require in evaluating a child from the ghetto who is showing growth retardation; justify the potential relevancy of the information you seek.	4 3 9 8	2 7	6	(8.2) 5		3 4	5 3	1 2	* 1	3.3 0
III. NEO-NATE										
A. Psychosocial - OBJECTIVES										
1. Discuss the theories of early social attachment (developed from animal and human experiments) as background for the subsequent behavior of the individual.	3 1 9 8	5 7	6	*(7.5) 5		5 4	2 3	2	1	0
(2.) Describe the major elements of the maternal-infant relationship and assess their significance to later development and behavior.	4 2 9 8	3 7	6	*(8.1) 5		6 4	2 3	2	1	4.0 0
B. Physiological - OBJECTIVES										
1. Describe the physiologic and biologic adjustments of the newborn (cardio-vascular, respiratory, carbohydrate metabolism, thermal control, bilirubin metabolism) to the extra-uterine environment.	6 2 9 8	1 7	6	(8.6) 5		5 4	3	2	1	4.0 0
2. List the major developmental reflexes of the infant and the sequence of their acquisition and disappearance.	9 9 8	7	6	(9.0) 5		6 4	2 3	1 2	1	3.6 0
3. Assess the presence or absence of infantile reflex as a means of determining the neurological status and maturity of the infant.	6 2 9 8	1 7	6	(8.6) 5		4 4	3 3	2	* 1	(3.2) 0
4.) Describe the relationship between the level of CNS maturation and the anatomical development of the brain.	4 2 9 8	3 7	6	*(8.1) 5		1 4	7 3	1 2	* 1	3.0 0
(5.) Describe the structure and formation of the face and oral cavity.	4 9 8	4 7	6	*(8.6) 5		4 4	5 3	2	1	3.4 0
6. Discuss the developmental sequence of tooth eruption in relationship to growth of the infant.	5 3 9 8	1 7	6	(8.4) 5		4 4	5 3	2	1	3.4 0
(7.) Differentiate between environmental and biological factors in the production of dental caries, malocclusion, and defects in tooth structure.	5 9 8	4 7	6	*(8.1) 5		5 4	4 3	2	1	3.6 0
IV. PRE-SCHOOL										
A. Normal										
OBJECTIVES										
1. Describe the normal developmental milestone's of children at 24 and 48 months in terms of: (a) gross motor; (b) fine motor-adaptative; (c) Language; (d) personal-social.	8 1 9 8	7	6	(8.9) 5		6 4	2 3	2	1	(3.8) 0
2. Describe the use of the Denver Developmental Screening Test, its applicability and standardization.	6 2 9 8	7	6	(8.5) 5		5 4	1 3	1 2	1	3.6 0

	Clarity of Statement: How clearly does this objective communicate the behavior which the student is expected to display in achieving the objective?					Desirability in MSHE Curriculum: How essential is it for every student in the program to achieve this objective?				
	Very Clear Level of Abstraction	Quite Clear Could Tighten Up	Partial Interpretations Possible Broad Work	Somewhat Unclear Revise It	Very Unclear Rewrite It	ESSENTIAL for all students	DESIRABLE but not essential	UNDESIRABLE but should not be required	UNCERTAIN	
3. Recognize similarities and differences between children of the same age with regard to CNS maturation style (environmental interaction), and cognitive functioning.	1 2	4	1	(7.1)		1	6	1	(3.0)	
	9 8	7	6	5		4	3	2	1	0
4. Identify the relevant biologic and adaptive factors that exist in the interaction between the child and his environment. (nutrition, illness, maternal-child interaction)	1 1	2	(7.1)	1		1	5		(2.7)	
	9 8	7	6	5		4	3	2	1	
5. Describe the sequential effects of biologic and adaptive development on personality and behavior.	2 1	3	(2.3)	1		4	3		(2.3)	
	9 8	7	6	5		4	3	2	1	
6. Given a clinical situation, pick out the biologic and adaptive factors and relate them to personality development.	3	2	(2.2)			1	6		(3.1)	
	9 8	7	6	5		4	3	2	1	0
7. Define cognitive functioning and identify the biologic and adaptive factors which influence it.	2 3	2	(8.2)			5	2		(2.6)	
	9 8	7	6	5		4	3	2	1	0
8. Describe the standardization and applicability of the WISC as a measure of intellectual functioning and the Draw-A-Man test as a projective measure of personality.	2 4		(3.4)			2	1	3	(2.8)	
	9 8	7	6	5		4	3	2	1	
9. Distinguish between speech and language; describe speech development, and language development.	2 3		(2.4)			5	3		(3.7)	
	9 8	7	6	5		4	3	2	1	0
B. Abnormal										
OBJECTIVES										
1. Discuss the concept of "developmental lag" for a given child in relationship to normative levels of maturation & functioning as described in the Denver Developmental Screening Test.	6 1		(8.9)			4	5		(3.6)	
	9 8	7	6	5		4	3	2	1	0
2. Describe the effects of biological (e.g., hypothyroidism, PKU) and environmental (e.g., maternal, nutritional) deprivation on development.	4 3	1	(8.4)			6	2		(3.8)	
	9 8	7	6	5		4	3	2	1	
3. Define learning disability and mental retardation and distinguish between the two.	6 1	1	(8.1)			7			(4.2)	
	9 8	7	6	5		4	3	2	1	
V. ADOLESCENCE										
OBJECTIVES										
1. Describe the developmental changes which take place at the adolescent growth spurt, specifically in the following areas: physical, endocrine, and psychosocial.	6 1	1	(8.6)			8			(4.0)	
	9 8	7	6	5		4	3	2	1	
2. For both male and female, describe the interrelationship between the physical, endocrine, and psychosocial factors with regard to sequence and age variability.	2 3	2	-1	(3.2)		3	4		(3.4)	
	9 8	7	6	5		4	3	2	1	
3. Describe the components of normal adolescent identity formation and describe their contribution to identity formation during early, middle, and late adolescence.	3 -1	1	(8.3)			7	1		(3.5)	
	9 8	7	6	5		4	3	2	1	
4. Define negative identity.	5 1	7	6	5		4 3	3 3	2	1	
	9 8	7	6	5						
5. Identify the major sources of identity conflict during adolescence.	9 5 .8 1	7 2	6	(9.4) 5		4 7	3 1	2	1 (3.9)	

	Clarity of Statement: How closely does this objective communicate the behavior which the student is expected to display in achieving the objective?					Outstanding in CHSC Curriculum: How essential is it for every student in our program to achieve this objective?			
	Very Clear! Leaves no doubt in mind	Quite Clear; Could Tighten it up	Marked Interpretations Possible Needs Work	Somewhat unclear Revision Needed	Very Unclear Rewrite It	ESSENTIAL for all graduates	DESIRABLE but not essential	USEFUL but should not be required	UNNECESSARY TIME
6. Given an adolescent with a chronic medical illness (e.g., diabetes), identify the biological environmental factors in his environment as they relate to his behavior.	9 8	7	6	5		4	3	2	1
7. Distinguish among frank psychiatric illness (depression, psychosis), adolescent deviant behavior, and normal adolescent acting-out behavior.	9 8	7	6	5		4	3	2	1
VI. MIDDLE YEARS									
OBJECTIVES									
1. Identify the principal, biological, psychological, and social components of normal development in the middle years.	9 8	7	6	5		4	3	2	1
2. Describe the major physiologic and biologic changes of the middle years; e.g., endocrine, muscule-skeletal changes.	9 8	7	6	5		4	3	2	1
3. Identify the physical and biologic changes in the middle years which relate to changes in body image and self concept. In addition, relate these psychological adjustments which are made in response to these changes	9 8	7	6	5		4	3	2	1
4. In the following examples, describe the interaction among biological, social, and psychological factors of illness in the middle years; e.g., heart disease, obesity, suicide, depression.	9 8	7	6	5		4	3	2	1
5. Identify the social and psychological components of the illness in the middle years; e.g., sexuality, depression.	9 8	7	6	5		4	3	2	1
6. Given a health professional such as a dentist, scientist, or a physician, identify the potential role conflicts throughout his or her professional life and career (roles such as spouse, parent, lover, boss, etc.).	9 8	7	6	5		4	3	2	1
7. Apply the concept of psychosocial development in the middle years to the examination of your own personal, sexual, professional, and family life.	9 8	7	6	5		4	3	2	1
VII. AGING									
OBJECTIVES									
1. Identify the principal biologic, physiologic, psychologic, and social components of the aging process.	9 8	7	6	5		4	3	2	1
2. Determine your own attitudes as a health professional toward older people (through the aging semantic differential) and categorize the origins of these attitudes.	9 8	7	6	5		4	3	2	1
3. Discuss ways in which societal attitudes towards the aged affect the delivery of care (e.g., health insurance, social security, medical availability, housing, and the extended family).	9 8	7	6	5		4	3	2	1
4. Given an aged individual with multiple disabilities, identify the major problems which confront the individual as well as the relationship of these problems to each other and to the environment in which that individual lives.	9 8	7	6	5		4	3	2	1
5. Analyze your feelings toward loss in aging.	9 8	7	6	5		4	3	2	1
VIII. DEATH & DYING									
OBJECTIVES									
1. Analyze your own feelings about the impact of fatal illness affecting a close friend, a patient, a family member, or yourself.	9 8	7	6	5		4	3	2	1

Clarity of Statement: How clearly does this objective communicate the behavior which the student is expected to display in achieving the objective?						Centrality in HCHE Curriculum: How essential is it for every student in the program to achieve this objective?					
Very Clear. Leave No Doubt	Quite Clear. Could Rephrase It Mo	Marked Interpretations Possible Beyond Mine	Somewhat Unclear. Revise It	Very Unclear. Rewrite It		ESSENTIAL for all students	DESIRABLE but not essential	WISHFUL but should not be required	UNCERTAIN Like		
7 9	8	2 7	6	(8.6) 5		7 4	2 3	2	(3.8) 1	0	
6 9	8	2 7	6	(8.5) 5		6 4	3	2 2	1	(3.5) 0	
4 9	2 8	2 7	1 6	* (8.9) 5		4 4	3 3	1 2	1	(3.8) 0	
3 9	3 8	2 7	1 6	* (7.9) 5		6 4	1 3	2 2	1	(3.8) 0	

3. Recognize the differences in the behaviors of individuals of various age-groups facing death, e.g. a three-year old child dying from leukemia vs. the death of a 36 year-old adult dying from leukemia.

3. Identify the impact of the death of an individual on his family and environment (a fetus through abortion, the loss of a child through an acute or chronic problem, the loss of an adult through an acute or chronic problem).

4. Recognize function limitation of denial and protest in the management of the dying patient.

5. Recognize the interrelated nature of the many factors which exist at the time of a person's death (medical, legal, religious, psychosocial, intra-family, etc.)

Comments:

GROWTH & DEVELOPMENT SUBJECT COMMITTEE

EDUCATIONAL OBJECTIVES

I. GENETICS AND EMBRYOLOGY

A. Genetics - Normal

OBJECTIVES

1. Explain and define polygenic inheritance with respect to: (a) multiple alleles; (b) quantitative traits; (c) continuous variations; (d) multi-factorial inheritance.

2. Given the general genetic classification of disease, characterize each of the components (single gene, polygenic, and chromosomal disorders) by its frequency range in the population and give two examples.

3. Given a known polygenic trait or disease, distinguish its inheritance pattern from that of one under single control; e.g., dominant or recessive pattern.

Genetics - Abnormal

OBJECTIVES

1. For each of these four major types of birth defects (e.g., genetic-chromosomal, infectuous, structural and mental) give appropriate examples which typify that category with regard to description, etiology, pathogenesis, occurence risk, and epidemiology.

2. Given a family in which a birth defect has occurred, describe the information necessary and the sequence and conditions under which one performs genetic counselling.

3. Given a genetic counselling situation, identify the major ethical, moral, religious, and social issues which may influence that interaction.

B. Embryology - Normal

OBJECTIVES

1. Describe mechanisms and principles (with appropriate examples) of the normal fetal development; e.g., (a) fertilication, (b) cleavage, (c) gastrolation, (d) induction.

3. Given a specific example of development during organogenesis, determine the interaction between environmental and genetic factors involved in that process.

4. Describe the development of the immune system (humoral, cellular), beginning with the fetus and determining that early relationship to post-natal life.

Embryology - Abnormal

OBJECTIVES

1. Identify and discuss some of the family planning factors found among parents (e.g., personality, social role, economic status, family size) that lead to the unwanted child.

2. Identify the consequences for the child of being unwanted.

3. State the principle components of Connecticut's abortion law.

II. GROWTH

A. Normal - Goals and Objectives

Goals

1. Understand the interplay of the genetic, humoral and nutritional factors in the control of the growth process at the cellular, organ, and whole organism level.

Objectives

1. Differentiate between hyperplasia and hypertrophy when describing cell and organ growth.

2. Distinguish between total organism growth and individual organ differentiation (e.g., the brain).

3. Describe the manner in which longitudinal and cross-sectional population growth curves are constructed and applied to populations.

4. Illustrate the manner in which growth curves are used in the evaluation of human growth.

5. Assess the major measures of developmental maturity (e.g., bone age, height age, dental age, weight age, head circumference) with regard to their ability to serve as indicators of normal growth.

6. Discuss the sequence of developmental events, the range of normal age of occurence, and the control mechanisms for the adolescent growth-sprout.

B. Abnormal - OBJECTIVES

1. Classify any given growth problem into one of the six categories: inadequate intake; failure to assimilate; increased metabolism; failure to utilize; failure of stimulation; and organ resistance.

2. Define and distinguish among birthweight, gestational maturity, and chronological age.

3. Distinguish between small for gestational age, appropriate for gestational age, large for gestational age, true prematurity, and low birthweight infant.

4. Given a child who is small-for-dates, determine the fetal, maternal, and placental factors which may have contributed to the etiology.

5. List 7 significant epidemiologic factors which contribute to the incidence of low birth weight babies.

6. Describe the impact of a low birth weight baby on the family, community, and society.

7. Describe the impact of a low birth weight on the growth and development of the infant.

8. Discuss the maternal deprivation syndrome as a model of the disturbance between biological and psychosocial stimulation in a child.

9. Describe the adverse effects of the following environmental factors on growth and development: malnutrition, lead, infection, pollution, overcrowding.

10. State the historical and environmental information you would require in evaluating a child from the ghetto who demonstrates growth retardation.

III. NEO-NATE

A. Psychosocial - Objectives

1. Explain the major theories of early social attachment (developed from animal and human experiments) which attempt to characterize the subsequent behavior of the individual.

2. Describe the major components of the maternal-infant relationship and discuss their influence on later development and behavior.

B. Physiological - OBJECTIVES

1. Describe the physiologic and biologic adjustments of the newborn (cardiovascular, respiratory, carbohydrate metabolism, thermal control, bilirubin metabolism) to the extra-uterine environment.

2. List the major development reflexes of the infant and the sequence of their acquisition and disappearance.

3. Describe the use of infantile (primitive) reflexes as a means of determining the neurological status and developmental maturity of the infant.

4. Given a specific neurologic function (e.g., walking), describe the relationship between CNS maturation (e.g., biochemical and physiological) and the anatomical development (e.g., histologic structure) of the brain.

5. Describe the anatomic structure and embryonic formation of the face and related structures.

6. Describe the anatomic structure and embryonic formation of the oral cavity.

7. Discuss the developmental sequence of tooth eruption in relationship to growth of the child.

8. Describe the environmental and biological factors which contribute to the production of the following: dental caries, malocclusion, and defects in tooth structure: suggest preventive and corrective measures.

IV. PRE-SCHOOL

A. Normal

OBJECTIVES

1. Describe the major developmental milestones of children at 24 and 48 months in terms of: (a) gross motor; (b) fine motor-adaptative; (c) language; (d) personal-social.

2. Describe the use of the Denver Developmental Screening Test, its applicability and standardization.

3. Given a group of normal children of the same age, account for their individual variations, with regard to CNS maturation, behavior and development, environmental interaction, and cognitive functioning.

4. Define cognitive functioning and identify the biologic and adaptive factors which influence it.

5. Describe the standardization and applicability of the WISC as a measure of intellectual functioning.

6. Describe the standardization and application of the Draw-A-Man test as a projective measure of personality.

7. Distinguish between speech development and language development; describe speech development in terms of anatomical factors and mechanical events; describe language development.

B. Abnormal

OBJECTIVES

1. Discuss the concept of "developmental lag" for a given child in relationship to normative levels of maturation in functioning as described in the Denver Developmental Screening Test.

2. Describe the effects of biological (e.g., hypothyroidism, PKU) and environmental (e.g., maternal, nutritional) deprivation on development.

3. Define learning disability and mental retardation and distinguish between the two.

V. ADOLESCENCE

OBJECTIVES

1. Describe the developmental changes which take place at the adolescent growth spurt, specifically in the following areas: physical, endocrine, and psychosocial.

2. For both the male and female describe the physical, endocrine, and psychosocial factors which influence the sequence and age variability of the adolescent growth spurt.

3. Describe the components of normal adolescent identity formation and describe their influence during early, middle, and late adolescence.

4. Define negative identity.

5. Identify the major sources of identity conflict during adolescence.

6. Given an adolescent with a chronic medical illness (e.g., diabetes), discuss the biological and environmental factors which influence his behavior.

7. Distinguish among frank psychiatric illness (depression, psychosis), adolescent deviant behavior, and normal adolescent acting-out behavior.

VI. MIDDLE YEARS

OBJECTIVES

1. Identify the principal, biological, psychological, and social components of normal development in the middle years.

2. Describe the major physiologic and biologic changes of the middle years; e.g., endocrine, musculo-skeletal changes.

3. Identify the physical and biologic events in the middle years which influence changes in body image and self concept. Discuss the psychological adjustments which are made in response to those changes.

4. Describe the biological, social, and psychological factors which influence the behavior of an individual in the middle years when confronted by one of the following problems: heart disease, obesity, suicide, depression.

5. Given a health professional such as a dentist, scientist, or a physician, identify potential role conflicts which are frequently encountered throughout his or her professional life and career (e.g., spouse, parent, lover, boss, etc.).

6. Utilizing the concept of psychosocial development in the middle years, apply it to the examination of your own personal, sexual, professional, and family life.

VII. AGING

OBJECTIVES

1. Identify the principal biologic, physiologic, psychologic, and social components of the aging process.

2. Determine your own attitudes as a health professional toward older people (through the aging semantic differential) and categorize the origins of these attitudes.

3. Discuss ways in which societal attitudes towards the aged affect the delivery of care (e.g., health insurance, social security, medical availability, housing, and the extended family).

4. Given an aged individual with multiple disabilities, identify a complete problem list including environmental factors.

5. From your present vantage point, consider and discuss your own feelings toward the phenomenon of loss is aging.

VIII. DEATH & DYING

OBJECTIVES

1. Analyze and discuss your own feelings about the impact of a fatal illness affecting a close friend, a patient, a family member, or yourself.

2. Identify the differences in the behaviors of individuals of various age-groups facing death, e.g. a three-year old child dying from leukemia vs. the death of a 36 year-old adult dying from leukemia.

3. Identify the impact of the death of an individual on his family and environment (a fetus through abortion, the loss of a child through an acute or chronic problem, the loss of an adult through an acute or chronic problem).

4. Identify the occurence and alterations which denial and protest impose on the management of the dying patient.

5. Identify and discuss the interrelated nature of the following factors which at the time of a person's death significantly influence the care of the patient and his family: medical; legal; religious; psychosocial; and intra-family.